

CW JAN74  
MI 48106X RUXUSHANJ 3309D 0902  
JI SCHALLHORN DATA SUPV  
XEROX - UNIV MICROFILMS  
XEG DATA CNTR-ANN ARBOR 20756  
300 N ZEEB RD  
ANN ARBOR MI 48106

# COMPUTERWORLD

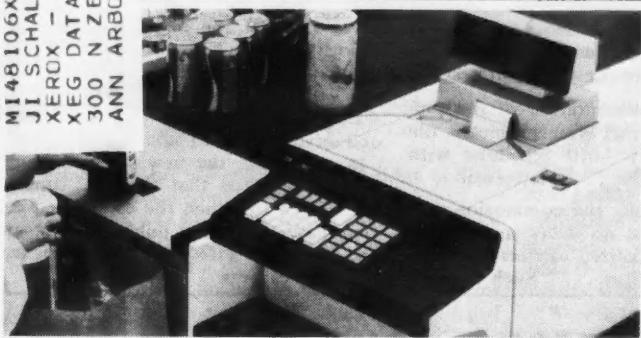
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

October 17, 1973

Vol. VII, No. 42



## IBM Goes to Market

The IBM 3660 supermarket system features a fixed-head optical scanner that utilizes laser technology to read the grocery industry's new Universal Product Code. A point-of-sale terminal can display an alphanumeric message up to 22 characters and print a customer receipt at 80 line/min. The terminal reports to an in-store controller with 28K bytes of memory and 5M-byte disk that acts as a link to a host 370. A communications unit can transmit the data from a store to a central site at 2,400 bit/sec using either binary synchronous or SDLC line control. A typical system with eight terminals will cost about \$118,000 with first deliveries scheduled for the third quarter of 1974.

## IBM Delays Second Virtual TP Release; SDLC Impact Expected

By Ronald A. Frank  
Of the CW Staff

WHITE PLAINS, N.Y. — IBM has delayed implementation of its Virtual Telecommunications Access Method (Vtam) and indications are growing that a major upheaval may be under way in the company's telecommunications software and hardware.

In a recent letter to prospective users, IBM said: "Availability of Vtam is delayed to provide additional time for testing and performance optimization and to better synchronize with support of the new Synchronous Data Line Control (SDLC)" [CW, Aug. 29].

The Vtam delay is the second

this year for announced IBM telecommunications software. In June, the company admitted that Team level five, the first implementation of its Network Control Program, had been delayed from March to this fall. The new Team is now available, according to a spokesman, but users who had planned on using Vtam in their teleprocessing networks will have to wait.

The first version of Vtam for DOS/VS had been scheduled for November but this has now been moved back until September 1974. And Vtam for OS/VS1 has been delayed from February to November of next year. Vtam for OS/VS2 users will be available in March 1975 instead of June 1974.

(Continued on Page 4)

## Survey Cites Materials Costs Business Forms Prices Rise as Much as 18% in '73

By Marguerite Zientara  
Of the CW Staff

Prices of business forms used in DP have risen from 3% to as much as 18% this year, and one forms manufacturer predicts a 50% increase in industry prices over the next two years, a recent Computerworld survey found.

Business forms manufacturers who have raised their prices said

the foremost factors dictating increases are increased costs of their raw materials (paper, ink, chemicals) as well as decreasing availability of adequate paper supplies.

Four small manufacturers of business forms interviewed had raised their prices within the last six months, one by 5%, one by 8%, one by an unspecified amount and one by "nothing formal."

And heaping more coal on the fire, John Hess, general manager of Computer Papers, Inc., Des Moines, Iowa, said: "We're probably charging for some things that have always been in the price book that we've typically waived."

Most people in the forms industry have been selling at lower than list price, with special concessions such as fast-pay discounts and free marginal words normally worth \$2 or \$3. Prices were decreased by negligence as

(Continued on Page 4)

### On the Inside

FCC Raps AT&T On Local Loop Plan — Page 2

Federal Buying Practices Criticized by CLA — Page 23

Communications ..... 17  
Computer Industry ..... 23  
Editorial ..... 8  
Financial ..... 38  
Societies ..... 21  
Software/Services ..... 15  
Systems/Peripherals ..... 19

## House Pushing Privacy Board To Watch Data Bank Operations

By E. Drake Lundell Jr.

CW Washington Bureau

WASHINGTON, D.C. — A bill calling for a Federal Privacy Board to protect individuals against "improper, incorrect or unauthorized compilation or dissemination of information" from computerized data banks has been introduced into Congress by 27 members of the House of Representatives.

The bill, H.R. 9786, would apply to all data banks — state and local government and private — and is considered a companion measure to the Federal Privacy Act introduced by Rep. Edward Koch (D-N.Y.) that would require federal agencies to reveal

the existence of data banks to affected citizens.

### Like Swedish Law

The new bill — which is "virtually identical" to the Swedish law requiring the registration of data banks [CW, Sept. 19] — would require all operators of data banks containing information on individuals to register with the Federal Privacy Board.

Like the Swedish law the federal agency would determine what information could be kept in a data bank, how that information could be stored and to whom the information could be distributed.

In addition, it would prohibit the collecting and storing of information on criminal acts, medical records, welfare records, etc. except in special circumstances and would severely limit how such records could be disseminated.

The board would be made up of seven members, each of which would serve a two-year term. They would be appointed by the

President with the advice and consent of the Senate, and no more than four members of the board could be from the same political party.

Any person keeping personal information on individuals and who failed to register with the board or who violated the provisions on what information was stored in his system or how it was disseminated could be liable to a fine of \$5,000 or a year in prison.

The maximum fine could go up to \$50,000 or 2% of the data bank operator's revenues in the case of class action suits, according to the bill.

### National Policy Needed

"It is about time that the Federal Government establish a national policy regarding computers and computer abuses in the interests of protecting the privacy of our citizens," Koch said in introducing the bill.

"Computers are becoming a hydra-headed monster. No

(Continued on Page 2)

## Judge 'Errs' on IBM Damages, Revision or New Trial Expected

TULSA, Okla. — Judge A. Sherman Christensen last week admitted his "computation of antitrust damages against IBM involved substantial error."

In the unusual move, Christensen said he would grant IBM a motion either to amend the finding he issued in the Telex-IBM case or else grant IBM a new trial on the issue of damages.

He said the decision on whether to grant a new trial on damages would be determined Tuesday, Oct. 16.

Several legal sources said the move might have been made because IBM and Telex are conducting serious negotiations on an out-of-court settlement. These sources suggested the judge

(Continued on Page 2)

## NRMA Conference Told

## 'Future of Retailing' Lies in DP

By Edward J. Bride

CW Washington Bureau

LOS ANGELES — The "future of retailing" lies in the use of computers, and specifically in the area of point-of-sale (POS) systems, most of which are now in the "infancy" stage of usage, according to speakers at last week's 15th annual EDP conference sponsored by the National Retail Merchants Association (NRMA).

While the concept of POS has finally been accepted by the retailing community, and while elements of POS can be found in banking and in many other kinds of data-base systems, conver-

sions are still difficult, they agreed.

POS, then, is reflective of the computer community five to 10 years ago, and this is interpreted

Other coverage of the NRMA conference on Page 31.

as signaling a rampant growth, possibly accompanied by problems similar to those encountered with a new generation of computer equipment or with an on-line system.

### Interconnection a Problem

Some elements of POS usage may be lagging behind the rest

of the computer community, but other problems are shared on a contemporary basis. Data communications technology and the problems of interconnecting independent or customer-owned equipment with the transmission facilities of AT&T appear to rank near the top, according to conference participants.

William H. Borghesani Jr., NRMA telecommunications counsel, warned of the "federal-state confrontation of the first magnitude" regarding the North Carolina Utilities Commission's attempts to preclude interconnection.

(Continued on Page 4)

## Bell Blasts Unfair Environment

# FCC Tells Bell: Stop Delaying Specialized Carriers

By Ronald A. Frank

Of the CW Staff

WASHINGTON, D.C. — AT&T has been told to stop delaying the services of the new specialized carriers to prospective users. But Bell, apparently feeling the sting of lost customers, continues to seek regulatory reconsideration of what it calls an unfair environment.

While the Federal Communications Commission was telling the Bell System to provide required local facilities to the specialized carriers' users, AT&T officially petitioned for reevaluation of the very FCC decisions that created Microwave Communications, Inc. and the other new carriers.

The FCC acted after AT&T said it would file interconnection tariffs with each of the individual states to provide local connections between specialized car-

rier facilities and their users' sites [CW, Oct. 10].

The commission told AT&T its plan to seek state approval for interconnections to interstate services being offered by MCI and other specialized carriers would be in "direct conflict" with the Communications Act of 1934, and the "policies and objectives of this commission" as set forth in the MCI, specialized common carrier and domestic satellite decisions.

### Local Lines Critical

The local lines are especially critical to the specialized carriers since they must rely on local telephone companies to complete the links between their long-distance terminals and user installations.

In the past the Bell System has said it would provide these local loops when and where required. Some regulatory sources interpreted the AT&T plan to gain ap-

proval from each individual state as a delaying tactic to stall the specialized carriers.

In its strongly worded letter, the FCC said its previous decisions had "made it clear that Bell System companies and other established carriers which have monopoly control . . . would be expected to provide, on reasonable terms and conditions, interconnection of such facilities as required by the specialized carriers to terminate the services which . . . have been duly authorized in the public interest . . .

"Effective implementation of our policy . . . requires that you promptly file [interconnection] tariff schedules with this commission . . .," the letter said.

In the meantime, the commission said, there "should be no delay in honoring requests of specialized carriers for interconnection facilities . . . Such facilities

can be provided under contracts on an interim basis "and we assume this will be done."

### AT&T Wants Reconsideration

The FCC decision authorizing the specialized carriers was reached without "full public hearings" and what has resulted is "contrived competition in which a few very large customers can enjoy lower rates at the expense of the vast majority of telephone users," AT&T said.

The new carriers are not offering any new or different services, "but only wasteful duplication of existing facilities and services," AT&T said.

In requesting the new set of hearings, AT&T suggested that the FCC consider the degree to which the established carriers have served the public interest and the long-term effects of the specialized common carriers.



THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

TM Reg. U.S. Pat. Off.

DR. H.R.J. GROSCH, editorial director

EDWARD J. BRIDE, editor

V.J. FARMER, managing editor. RONALD A. FRANK, technical news editor. E. DRAKE LUNDELL JR., computer industry editor. MARVIN ARONSON, assistant managing editor. DONALD LEAVITT, software editor. MICHAEL WEINSTEIN, systems editor. MARY UPTON, financial editor and assistant computer industry editor. LESLIE FLANAGAN, JUDITH KRAMER, copy editors. PATRICK G. WARD, TONI WISEMAN, MARGUERITE Y. ZIENTARA, staff writers.

E. DRAKE LUNDELL JR., Washington bureau. MARVIN SMALHEISER, West Coast bureau. J.H. BONNETT, European bureau. HIDETSUNA SASAKI, Asian bureau.

CONTRIBUTORS: J. DANIEL COUGER, education column; FRANK GREENWOOD, management column; ALAN TAYLOR, Taylor Report and professional practices.

NEAL WILDER, vice president — Sales. DOROTHY TRAVIS, Sales administrator. JUDY MILFORD, advertising coordinator. KATHRYN V. DINNEEN, market research.

LEETE DOTY, production manager. HENRY FLING, production supervisor.

W. WALTER BOYD, publication manager. PATRICK J. McGOVERN, publisher.

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529. Washington: Room 1129, National Press Bldg., Washington, D.C. 20004. Phone: (202) 638-0901. Telex: 89-544. Los Angeles: 963 N. Edgecliff Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW19 PF, England. Phone: (01) 458-2248/9. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1973 by Computerworld, Inc.

25 cents a copy; \$9 a year in the U.S.; \$10 a year in Canada; all other foreign, \$25 a year. MARGARET PHELAN, circulation manager. Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160.

Reproduction of material appearing in Computerworld is strictly forbidden without written permission. Send all requests to publication manager.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

COMPUTERWORLD, INC.

Patrick J. McGovern ..... president  
W. Walter Boyd ..... executive vice president  
Robert M. Patterson ..... vice president-int'l.  
T. Neal Wilder ..... vice president-sales



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

## Congress Expected to Approve New Privacy Bill

CW Washington Bureau

WASHINGTON, D.C. — The recently introduced legislation to establish a Federal Privacy Board may have greater chances of success than most privacy legislation in the past few years.

The bill has garnered strong support from both liberals and conservatives in the Congress and has been referred to the House Subcommittee on Civil Liberties and Constitutional Rights — and three of its members are cosponsoring the legislation.

In the past, the Federal Privacy Act, which would require federal agencies to notify individuals of records kept about them, has been referred to the House Committee on Government Operations, which has been slow to take any action on the measure which is still languishing almost four years after it was first introduced.

The Subcommittee on Civil Liberties and Constitutional Rights, however, is expected to take swift action on the new measure and hearings will be held on the bill either later this year or early next year.

In addition, there have been two recent reports on data bank operations that support the notion that some type of federal legislation is needed to protect individual rights in the operation of such systems.

With both the National Academy of Sciences and the Department of Health, Education and Welfare reports backing the need for regulation on a federal level, it will be hard for Congress to procrastinate on such legislation, one of the bill's

## Bill Calls For Privacy Board

(Continued from Page 1)

amount of state legislation will ensure that residents of another state will be protected. We must have federal oversight in this matter," he added.

In addition, Koch stated, "the bill will not prevent the collection of valid data either by private or governmental agencies, but will impose reasonable controls on what can be collected or how it can be dispersed so as to protect the privacy of citizens."

supporters noted.

And since the new act is patterned closely after the Swedish law regulating data banks, the successful implementation of the measure in Sweden will also boost the bill's chances, he said.

"Up until now there has been more talk than concrete action in the area of privacy, but I think the time has finally come for Congress to act in this area," he added.

## It's Called 'Shirting Real Issue'

By Patrick Ward

Of the CW Staff

PHOENIX — In a fast-changing world, will fire sales be replaced by computer error sales?

Diamond's department store here ran an ad recently that read, "Because a computer broke down . . . we can offer you a break on our very best selling name brand shirt.

"A computer can make human mistakes, too," the ad revealed, "... the kind that cause a very well-known shirt manufacturer to find out he had a whole lot more shirts than he had planned for

... so they have to go . . ." "Sometimes," the ad concluded, "computer mistakes are nice."

But did a computer actually break down to cause a shirt surplus? Not exactly, according to the Arrow Shirt Co., maker of the shirts in question.

There was an oversupply of shirts, and it was a little heavier than normal for the time of year, but a computer breakdown did not cause it, according to Bryan Wordell, the company's western district sales manager.

Rather, he said, Arrow was just clearing its stockroom as the season ended.

"We are very computer-oriented," Wordell said.

Wordell did admit that human errors do appear from time to time in the company's computer operations, but nothing to cause warehouses to bulge with unexpected shirts.

But the store stuck to its guns. "Whatever appeared in our ad was information that was passed on to us from Arrow," said Duane Nathe, Diamond's vice-president and sales promotion director.

James Smith, the Arrow salesman who handles the store's account, does not recall "anyone saying that our computer broke down."

But, Arrow salesmen did mention their company's manual inventory had found more shirts than a computerized inventory had indicated, and, Smith said, that was where the surplus shirts came from.

## Revision on Damages

### Against IBM Possible

(Continued from Page 1)

may have been indicating he would go along with a settlement that reduced the dollar damages granted to Telex.

In a second order Christensen outlined four questions the attorneys for each side should answer at Tuesday's hearing:

1. "To what extent should the amount of the trade secret counterclaim be offset against plaintiff's (Telex) actual damages prior to trebling?"

2. "Beyond the amount and bases of the counterclaim judgment, can the competitive advantage secured by Telex through misappropriation of trade secrets be quantified on the present record?"

3. "If so, should such competitive advantage as so quantified also be deducted from the antitrust damages before trebling?"

4. "Are there economic data in the present record sufficient to permit a reasonable quantification of the effect of the injunctive relief granted against IBM upon plaintiff's damage projections and if so, what is it?"

## Calif. Hires Specialist

# Insurance Examiners to Learn DP

By Marvin Smalheiser  
CW West Coast Bureau

SAN FRANCISCO — The state Department of Insurance has hired a computer specialist to start a training program for examiners.

Dean Robinson, a 15-year veteran of data processing, said guidelines will be set up for examiners to use when they want to check out a company's data processing.

The training program for the department's 45 examiners will be set up shortly, said Robinson, a past president of the Computer Operations Managers Association of San Francisco.

For the past 15 months he has handled operations of DP service for the Pacific Coast Stock Exchange.

Previously he was with DP operations at California insurance companies for 13 years.

Robinson was hired following a recommendation by an EDP committee named by Insurance Commissioner Gleeson L. Payne.

It was named following the Equity Funding Corp. of America scandal in which it was alleged

bogus insurance policies were manufactured with the aid of the computer system.

"We're going to help the department get some expertise in data processing and computer technology so they can more effectively examine the DP departments in insurance companies we're responsible for," Robinson said.

"We will evaluate some software packages which will enable examiners to sample machine-sensible files and do analyses of them."

Robinson will be working for Christy Armstrong, chief examiner for the insurance department.

Robinson, he said, will be used not only for training and setting up guidelines, but as a staff resource, advising the department and examiners.

The training will be an ongoing program, Armstrong said.

Robinson said the main problem now is that examiners go into insurance companies and quickly find they are dealing with DP listings and reports with which they are not entirely familiar.

"We will try to remedy that," he added.

## OTB Breakdown Laid To Failure of Drums

NEW YORK — If you think computers are a "sure bet," consider the day in August when the Off-Track Betting computers went down for three hours and lost \$800,000 off the track.

Betting stopped completely in 112 parlors and through telephone accounts on three races scheduled for that day. The cause of the breakdown has not been fully determined, according to a spokesman for American Totalisator Co., which does OTB's computer work on a Varian 620 L100 processor.

According to Irving Rudd, public relations publicist for OTB, the failure was due to the "simultaneous failure of two drums in the computer." He said there was a "trillion-to-one" chance of both drums failing at the same time, and he considered the breakdown as "disastrous and total" as the Northeast blackout of several years ago.

Normally one drum subsystem served as backup for the other, and a problem in one was transparent to the system.

"When there are no computers working there is no betting service," Rudd said. "It would be too costly to keep a manual backup system in reserve."

## PAY-RYTE

### COMPLETE PAYROLL SYSTEM

- IBM & OTHER MFGRS.
- 32K MIN.—COBOL
- Multi.-Co./Div./Dept.
- All Pay Frequencies—One Pass
- Salaried/Hourly Payrolls
- Union-Job Class-Rate Matrix
- Up to 99 Types of Pay
- Up to 99 Misc. Deductions
- All Fed./State/Local Taxes
- All Canadian Taxes
- 20 Reports & Listings
- Checks or Bank Statements
- Free Specification Manual
- Complete Documentation
- Money Back Guarantee
- Have Slides—Will Travel

\$6,500  
CONDATA, INC.

1809 Walnut Street  
Philadelphia, Pa. 19103  
(215) LO 9-4240

## Confidence is dealing with the world's largest independent peripheral manufacturer.



### Ampex solved the throughput puzzle by developing extended core memory.

Remember when selection of a System 360 Mainframe amounted to taking an IBM loyalty oath?

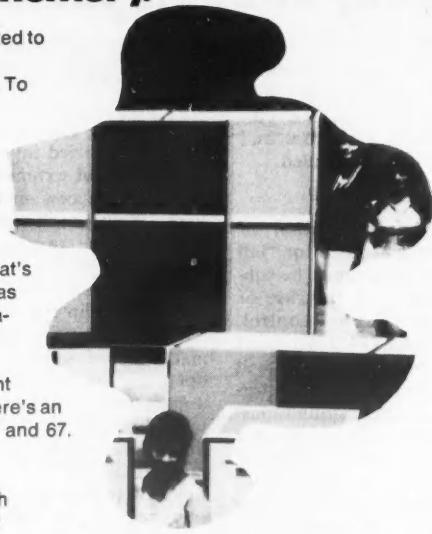
That's why Ampex developed ECM — Extended Core Memory. To let a person unplug the IBM 2361 LCS and plug in something better. Our ECM works at double, or even triple the throughput. It has faster cycle time. Dual-tail input for alternate operation with two computers. Built-in self test capability. Two-way interleaving. Unmatched field service support. And a big jump in cost effectiveness.

An Ampex ARM-2365 Core Memory (for the 360/65 and 67) is available with a full megabyte of memory in a single cabinet that's even a shade smaller than IBM's 265K model. One of ours works as hard as four of theirs. And you can go all the way out to 4 megabytes of memory on line at a cost far lower than one megabyte from IBM.

You'll find Ampex modules that plug right in and achieve instant expansion, instant throughput improvement, instant savings. There's an Ampex core expander for System 360 Models 22/30/40/50/65 and 67. There are cores for System 370 Models 155/165. Ampex lets you go "beyond the limits" by at least a factor of two.

Don't get the mistaken idea we're critical of IBM. We note with pleasure that they have designed some very fine mainframes that are fully Ampex-compatible.

Ampex has all the pieces. Call toll-free 800-421-6554 to find out how they fit.



**AMPEX**

Ampex Computer Products Division  
13031 West Jefferson Boulevard, Marina del Rey, California 90291, 213-821-8933

# Business Forms Prices Increase as Much as 18% in '73

(Continued from Page 1) many suppliers "overlooked" charging for special services.

Jim Stanton, marketing manager for International Business Forms, which raised its prices 8% in March, cited the phasing out of the cheaper grades of material by the suppliers as one of the major reasons for International's price increase.

After Central States Business Forms of Bartlesville, Okla., absorbed three price increases on materials, according to Berky Irwin, assistant marketing manager, "we couldn't stand it any longer," and put on a 5% surcharge in August.

## Labor Costs Up

In addition, labor costs are contributing to the price increases, although far less than the price of paper, according to Florence McDonald in the dealer sales department of Systomatic Business Products, Paramus, N.J.

All of the smaller manufacturers agreed that prices can go "only up" and basically because of material increases. Computer Papers, Inc., which specializes in custom forms, predicted prices would be up "at least 50%" in the forms industry as a whole.

Two users who said they were having good luck with their suppliers cited Uarco, Inc., Barrington, Ill., as a major or sole supplier.

Ford Motor Co. in Dearborn, Mich., claimed it has had no trouble getting business forms lately, has experienced no price increases and has not been forced to higher grades of paper by Uarco. The reason for such treatment, according to Charles Gump, manager of DP services, is that Ford has signed a sole-supply contract with Uarco.

United Airlines, headquartered in Chicago, also gets the majority of its supply from Uarco, according to Gary Heitsch, graphic arts buyer. The airline

has had no problems getting forms and has experienced only a 3-1/2% rate increase in six months. Reordering lead times have been extended two or three weeks beyond the usual four weeks, Heitsch said, but on the whole, there has been "no substantial inconvenience" for the airline as far as its business forms supply is concerned.

A spokesman for Uarco said the firm "has complied with the regulations of the price board."

Standard Register Co., with only a 3% increase in the list price on selected products, effective last April, is "trying to hold the line on prices to our customers all we can in the face of increasing paper costs," according to Will B. Rodemann, vice-president, marketing. The firm is finding it very difficult to get paper, Rodemann said. "It requires scrambling all the time by our purchasing people."

Rodemann echoed the assertion that the industry has been selling below list levels since the early 1960s, but said that Stan-

dard Register's overall average net prices are still "very much" below its catalog list level.

On the other hand, Morely Co. of Portsmouth, N.H., has had an 18% overall increase already this year, according to Fred Taylor, marketing manager. "Since the end of July, we've been holding the prices for our regular customers for 60 days. They were changing from every 10 to 30 days," according to Taylor. "We've had another increase since then but I've held on my steady customers."

The problem, according to Taylor, revolves around carbon as well as bond paper. "We're fooling around, like everyone, with carbonless paper to see if we can get around that, but nothing is firm yet," he said.

Moore Business Forms of Niagara Falls, N.Y., instituted a 5% price increase in July and, according to account representative Chuck Scott, can probably look forward to a 5% increase every six months. "The paper mills aren't giving us any

notice," he said. "They're sending what they have and telling us the price."

Among users whose suppliers' prices have gone up, Procter and Gamble, headquartered in Cincinnati, Ohio, has experienced a "drastic" increase of 10% to 20% in the last six months, according to Gary Perkins, supervisor of data I/O services. Perkins attributed the price increases to a shortage of pulp and an increase in demand for forms. Procter and Gamble's lead time has been moved up from about two weeks to a month, Perkins said.

Prudential Insurance Co. of Boston has experienced a 25% to 35% price increase and a lead time extension of a month, according to buyer Frank Fitzmaurice.

While many business forms manufacturers have shortened the period for which their prices are guaranteed (Moore, for example, has gone from one year to three months), no users interviewed have actually run out of

paper because of it.

In an effort to trace the problem to its origins, CW talked with representatives of two large paper manufacturers, both of whom preferred to remain anonymous. The major reasons given for the tight paper supply were:

- A major pulp shortage.
- A number of paper mills have been closed down because of antipollution costs.

- There are few new paper machines because each machine costs \$60 million to \$80 million, and companies have gotten a low return on the investment in recent years.

- A new, far greater demand for paper than the capacity for making it allows.

And there is little relief in sight. Most paper manufacturers, business forms manufacturers and users predict a continuing tight market and, in the words of one spokesman, "Prices are going to go up just as high as the market will permit and the government will allow."

# 'Future of Retailing' Lies in POS Systems

(Continued from Page 1)

This attempt amounts to a bid to nullify the 1968 Carterfone decision, the attorney said.

While this attempt could impact all data communications users, it is especially significant for those considering POS, since most of these systems include a minicomputer that communicates with a larger regional or corporate-owned system, speakers commented.

Borghesani recalled that Clinton D. Warkow, attorney for Montgomery Ward, told a Senate antitrust committee that Ward had found interconnection and the use of non-common-carrier equipment "of great value," adding that the special features,

service and lower rates of independents had saved Ward over \$1 million per year.

NRMA has filed and is continuing to give testimony to the various committees studying the North Carolina situation, particularly the Federal Communications Commission.

## Sears Speaks Out

Sears Roebuck, considered by some to be in the forefront of POS usage with an extensive national system, sent several speakers from both the policy-making and operational levels to discuss various aspects of POS.

Jack Miller, national director of data processing, said the most important aspect of these systems is with inventory control.

Richard R. Callahan, regional controller for Sears in the Los Angeles area, commented that POS represents a great opportunity to reduce accounting errors and errors originating from human or manual input.

There has been enough experience with POS to pinpoint some trends or commonly held beliefs on successful characteristics, the Sears group contended.

For example, Miller pointed out, the "wand reader" for sales tags represents the most accurate and speedy device for entering information. Once the brief training cycle is passed, accuracy approaches 100%, Callahan added.

On the other hand, less expen-



Moses Shapiro

sive, more mechanical means for data entry, even keying in the data, are possible if shorter stock numbers are used, it was noted.

## IBM's Blessing?

The phenomenon of "IBM's

## DP Intended to Amplify, Not Replace, Management

LOS ANGELES — The next decade may bring back house calls by doctors, equipped with portable computer terminals for remote access to medical data bases, according to F.G. "Buck" Rodgers, vice-president and director of marketing at IBM.

The data bases will include diagnosis of ailments and suggested remedies, and will be accessed through telephone lines, he predicted.

Addressing a luncheon gathering during the National Retail

blessing" was dismissed by Moses Shapiro, board chairman of General Instrument, manufacturers of the Unitote system. He referred to IBM as a "Johnny-come-lately" to the POS arena.

Shapiro said the current makers of POS equipment did not need "IBM's blessing" in order to promote acceptance of POS. He said this aspect of computer usage had been "off and running" for several years.

While Shapiro's statement may be true, it was also noted that one of IBM's strongest holds is in the retailing market. It was estimated that as many as 85% of the department stores with computers have IBM computers.

## Merchants Association (NRMA) annual conference, Rodgers said businesses are finally beginning to use computers as they were originally intended — to amplify, rather than replace the management process.

"As we get more applications-oriented," he commented, it is necessary to keep social goals, and not just "the bottom line," as management objectives.

In fact, the greatest changes of the next decade, he predicted, will be in the field of management. No longer will decisions be made strictly on the basis of fundamental data with profit as the key motivation, but rather with people in mind.

Business needs to adopt the precepts of respect for the individual, dedication to service, and a struggle for excellence ("a corporation has the right to expect the best of its people"), if it is to succeed, he stated.

Calling mediocrity a "natural" but "insidious" disease, Rodgers said there is no substitute for human relations. He also said business must educate its people and retrain, where necessary, so that the "why's" of decisions are known (not just the "how's" of implementing the policy).

## 2nd Virtual TP Release Delayed, SDLC Impact Seen

(Continued from Page 1)

Vtam was first announced in February 1973, and an IBM spokesman said there are currently no Vtam test sites and none has yet been scheduled.

### SDLC Due When?

The first implementation of SDLC is now scheduled for "fall 1974" but this also may be subject to change. The first use of SDLC, a full-duplex line control, will be on the 3704/3705 front ends but IBM undoubtedly will announce a new family of terminals and other communications hardware to utilize it. One of the problems users will face is that current binary synchronous devices will not be compatible with SDLC or its equipment.

It is believed IBM will introduce a series of microcontrollers to implement the SDLC line discipline on existing buffered terminals and other programmable communications devices, according to industry experts.

These microcontrollers will operate "out close to the modem," according to one source, because existing line control between the front end and

the CPU will be programmed for half-duplex operation.

There is some doubt how effective these microcontrollers will be since the benefits of SDLC cannot be carried into the mainframe without extensive modifications of access method software. Whether this problem is related to the announced Vtam delay is not known.

SDLC is also expected to play a major role in the operation of teleprocessing networks which make use of satellite links. By operating in continuous full-duplex mode, SDLC equipment will eliminate the troublesome line turnaround delays now encountered on airborne data links. With existing line control methods, special software is required to overcome this problem.

In delaying both Tcam and Vtam, some experts believe IBM telecommunications software experts are encountering significant problems with implementing communications control methods in a virtual environment. This could explain IBM's silence on releasing any additional details on SDLC or what it will mean to the user.

## NRMA Attendance Sets Record

LOS ANGELES — Attendees at last week's National Retail Merchants Association (NRMA) conference here represented both EDP and corporate management, as well as operational personnel, and a new attendance record of about 700 was set.

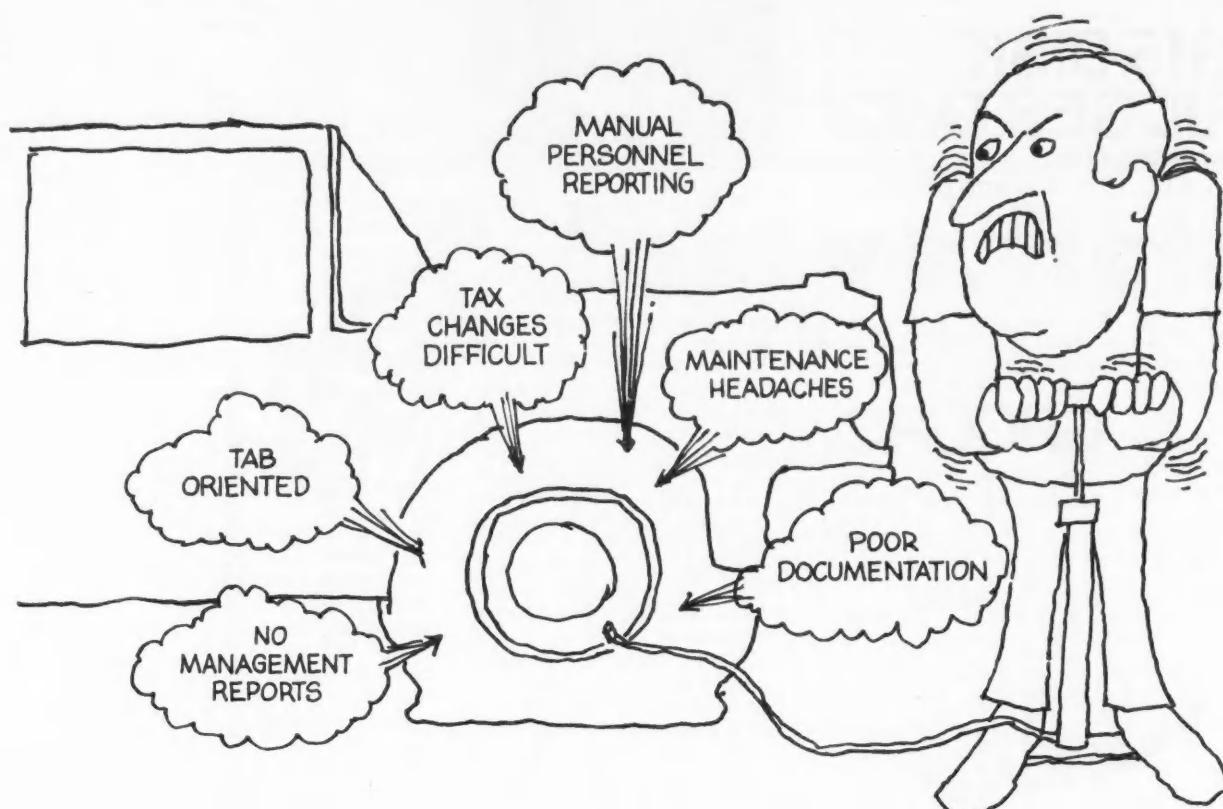
Irving Solomon, NRMA vice-president, said computers in retailing, and particularly point-of-sale (POS), were experiencing rapid growth, and he added that next year's conference will probably accentuate "point-of-receipt" systems.

Five firms that market POS equipment and/or services to retailers displayed their wares in separate meeting rooms during the conference. NCR, AT&T, American Regitel, Interface Mechanisms, Inc. and Unitote all had POS gear or related equipment on display.

Additionally, workshops were conducted by other suppliers who did not bring hardware, and these included Singer and IBM, which attracted standing-room-only crowds, as well as Sweda, Pitney-Bowes and Data Source Corp.

# Payroll Flat ???

**Messy .....?**  
**Slow .....?**  
**Ancient ...?**



**Get back on the road with**  
***phi payroll systems***

Benchmarks against our nearest competitor consistently show that PHI PAYROLL SYSTEMS are faster, more flexible, and easier to run.  
PHI Systems Include:

- PHITAX for Easy Tax Maintenance
- Powerful Report Generator
- Remote Terminal Option
- Complete Personnel Capabilities
- Management Reporting
- Canadian Taxes and Reports
- In Excess of 150 Installations
- Operation on IBM S/360 and S/370, B-3500, and H-6000 Hardware.

For more information, just fill out and mail the handy coupon or call James W. Lees at (617) 851-4111.

**phi payroll systems** are products of



COMPUTER SERVICES  
(formerly **phi** Computer Services)  
A Division of Wang Laboratories, Inc.

836 North Street, Tewksbury, Massachusetts 01876 (617) 851-4111

Gentlemen:

Your COMPUTERWORLD ad about PHI PAYROLL SYSTEMS interests me — please tell me more.

My Name \_\_\_\_\_

Position \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Computer \_\_\_\_\_

Clip and mail today to James W. Lees, WANG Computer Services, 836 North Street, Tewksbury, Massachusetts 01876.

## New 370/158K Available for December rental

2 Megabyte System for rent on operating lease at 83.5% of IBM MAC. Investment tax credit available.

**370/155J** also available  
in December. 2 year lease

**Transnational Computer Division**  
H.N. Boyd Investment Company  
Fifth Avenue at 2 West 45th Street  
New York, N.Y. 10036 (212) 489-8710

## NEW 2315 DISK CARTRIDGES ONLY **\$85** for Burroughs 1700, Basic 4, DEC, IBM 1130 and others

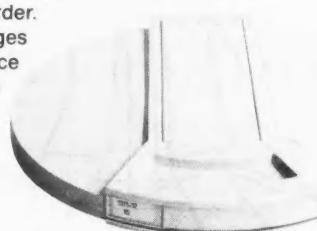
Group/3, one of the leading disk pack and cartridge distributors in the United States, is able to sell fully warranted new 2315s at a phenomenally low price because of its mass buying power. The savings are passed along to you. Join thousands of others who are currently purchasing disk cartridges from Group/3. It makes sense. It saves dollars.

**Ordering information:**  
Your check is your order.  
All 2315 disk cartridges shipped to you surface prepaid. California residents add 5% for sales tax.

You don't believe it? Call toll-free...800-421-0702. In California, call collect 213-653-1833.

Send your check (which is your order) to...

**GROUP/3**  
6399 Wilshire Blvd.  
Los Angeles, Calif. 90048



if you're  
going to use  
punched paper tape  
and edge punched cards...  
use

**ROYTRON**

the most reliable  
paper tape and  
edge punched card  
punches and readers  
in the industry  
for over a decade.

OEM PRODUCTS DIVISION  
**LITTON ABS**  
Automated Business Systems  
34 Maple Avenue, Pine Brook, N.J. 07058/(201) 575-8100

## Security Conference Told

# Users Most Liable to Fraud Now

By Edward J. Bride

Of the CW Staff

The aftermath of the Equity Funding fraud goes far beyond the Los Angeles data center of that company. It has spread to the auditing and the security communities, and quite probably to the rest of the computer community.

And Donn Parker, the Stanford



Williams

### ... "Management Innovation"

Research Institute's specialist in computer crime, believes computer users have never been more vulnerable to fraud and embezzlement than they are presently.

At the annual conference of the American Society for Industrial Security, Parker noted that in the future, computer users may be safer than they are now. But for the near term, there is great vulnerability, Parker claimed at the New Orleans conference.

In Philadelphia the following week, the fledgling Eastern States Association of Bank Data Processing Auditors (ESA/BDPA) hosted a meeting during which many speakers called for close monitoring of DP procedures and for a higher degree of professionalism among DP auditors.

Banks have "only just begun" to use automation effectively, according to one speaker, who noted that computerization of

bank transactions "will provide fewer audit trails than existed in the past."

Thomas W. Williams, senior vice-president at Wachovia Bank and Trust Co., said that because of increasing amounts of data

### What Has Equity Wrought?

transmission, control over I/O will become more complicated.

With society becoming more complex, along with computer technology, there will be less reliance on the human element in data processing.

"Management innovation" is a must, he said, since lower-level people would be "pushed to the wall" as far as temptation is concerned. With credit plans easy to use and with technology facilitating embezzlement and other forms of theft, it is vital to review personnel to assure that performance of specific duties is according to company policies, Williams said.

The DP audit, Williams continued, is becoming more difficult with the more complex software and systems.

EDP audits can best be performed by people with training in both computing and auditing, according to Chuck Coen, principal bank counselor for the Bank Administration Institute (BAI) which cosponsored the meeting with ESA/BDPA.

Describing BAI's standards for internal auditing, he said individual proficiency is the keystone, since no other elements could exist without the ability to do a good job.

The other areas of auditing apply both to the auditor and to his relationship with others in the corporate structure, Williams noted.

For example, an auditor must perform his skills to the best of his ability, and schedule his work properly, as well as exam-



CW Photos by Edward J. Bride

**Coen**  
... Individual Proficiency  
ine internal controls, documentation, plus the reporting structure within the company — all of this while retaining independence of the operational personnel being audited, he noted.

Coen drew support from Homer B. Lovvorn, senior vice-president of the North Carolina National Bank, who said that aside from the assignment of competent personnel for audits, both the executive management and the division being audited must want an effective audit program.

Lovvorn noted that an audit program he helped organize experienced difficulties because of insufficient resources, in both money and people, as well as a lack of management education on the benefits — and the ongoing progress — of the audit.

One of the statements made at the earlier security meeting in New Orleans related directly to the auditing conference in Philadelphia. Peter Browne, superintendent of the DP executive office at State Farm Mutual Automobile Insurance Co., said 100% security is impossible to attain, but risks (physical or otherwise) must be reduced to an "acceptable level."

Browne and Parker both contended that computer-aided thefts generally are exposed by controls not related to data processing.

And at the auditing meeting, another speaker stressed that if

(Continued on Page 7)

## Quantor COMMON SENSE in Credit Look-up



Major charge-card firms credit  
Quantor COM  
with speed account look-up.

**Quantor**

520 Logue Avenue, Mountain View, California 94040 (415) 965-3700;  
Oak Brook (Chicago) (312) 654-3720; New York, N.Y. (212) 279-3280;  
Washington, D.C. (703) 960-3707; Los Angeles, Calif. (213) 849-3634;  
Miami, Fla. (305) 448-3650; Atlanta, Ga. (404) 237-1176;  
Houston, Texas (713) 772-1772; Philadelphia, Pa. (215) 643-2250

## Users Most Liable to DP Fraud

(Continued from Page 6)

objectives are not attainable, then auditors have "wasted our time."

Richard C. Wanlin, director of the program planning division of the Office of the Comptroller of the Currency, said any program being governed by the philosophy of management by objectives must be governed also by "reasonable" objectives.

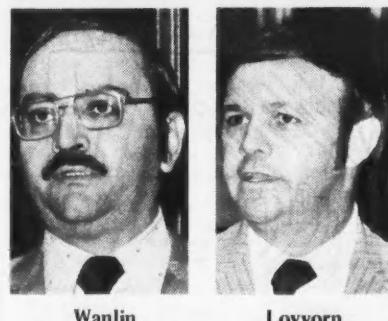
### Security Checklist: Fire Prevention An Involved Process

TORONTO — Is your computer installation secure? Or is it vulnerable to costly damage from the hazards of fire, floods, mechanical breakdowns, fraud and lost programs and data files.

A simple way to determine the security of your computer system is to check it against the following security "musts" concerning fire prevention and protection:

- Have qualified personnel inspect the computer center to see if it is divided into segments for fire control purposes with all partitions made of fire-resistant materials.
- Equip all areas of the computer room and library with ionization fire detectors, connected to automatic alarms and extinguishing systems, to protect against localized fires in data processing equipment.
- Have the installers test these detection systems every six months.
- Install audible alarms which can be manually reset by the fire department in case of a false alarm or in case of a small fire which can be put out with portable fire extinguishers.
- Equip the computer center with an automatic sprinkler system and a gas flooding system, such as Halon.
- Consider a sprinkler system which shuts off automatically.
- Equip the computer room with portable carbon dioxide or other gas fire extinguishers to combat machine or electrical fires.
- Inspect fire extinguishers regularly to ensure that the seals are not broken. Have qualified personnel periodically determine if they are charged.
- Train computer center personnel to use portable fire extinguishers.

This checklist was compiled by DCF Systems Ltd., 74 Victoria St., Toronto, Ontario M5C 2A5.



Thus, EDP audits must be workable, Wanlin said, and auditors must be as knowledgeable as the people they are auditing.

What many of the speakers at these meetings really agreed on was the fact that auditing, security and many other DP functions rely more on people than on technology.

They did not agree whether solutions to

## Keep Current to Beat Fraud

PHILADELPHIA — Computer users are most vulnerable to fraud around the time of a hardware or software failure.

This was one of several problems of computer users, especially banks which use DP techniques to manage and transfer money, reported by Homer B. Lovvorn, senior vice-president of the North Carolina National Bank.

Among the other considerations he cited were personnel training and technology itself. He made his remarks at the conference of the Eastern States Association of Bank Data Processing Auditors.

Restoration of data integrity after a hardware or software malfunction is crucial, Lovvorn commented, since "smart crooks" will find weaknesses in systems during such times.

the current threats could be found first in people or machines — a combination of approaches seemed the solution.

But repeatedly, fears were expressed

One of the biggest problems facing banking users relates to this first situation, namely how to keep the EDP audit staff current, in view of a changing technological environment.

A simplified answer would be to devote sufficient time to training, he noted; the problem is that, according to Lovvorn's definition, "sufficient" means 15% to 20% of a person's time being devoted to off-site education.

This is "necessary for a healthy, responsible EDP audit function," he commented.

As for technology, Lovvorn found that ever since the American Bankers Association adopted the magnetic stripe as a standard for credit cards and other financial media, attempts have been made to show the weaknesses of that standard.

that an Equity Funding could happen to the banking field and many other areas of computer usage, such as retailing and credit bureaus.

# data base: fact vs. fiction

### DATA BASE: FACT VS. FICTION SEMINARS BY LEO J. COHEN

Laid out for you in unmistakably clear and definitive terms—in a one-day, 8-hour seminar—by Leo J. Cohen, nationally prominent author, lecturer, and consultant; and by Alan H. Stutz.

If you are about to take the plunge (make the data base commitment) or if you are "the man in the middle" (the data base administrator), these specific and informative seminars will clear the air, sweep away misconceptions . . . and make it easy to reach a decision!

Just fill in the coupon below. EVEN IF YOU ARE NOT READY FOR A DATA BASE SEMINAR, WE CAN STILL BE GOOD FRIENDS. CHECK APPROPRIATE BOX ON THE COUPON, AND WE WILL SET YOU UP WITH A VALUABLE, FREE SUBSCRIPTION TO THE "PDC DATA BASE NEWSLETTER."

For your information, some of our recent data base clients are: Navy Bureau of Personnel, New York City Police Dept., Equitable Life Ins. Co., Aetna Life Ins. Co., Boeing Corp., Acme Markets, Inc. and PPG.

### SUBJECTS TO BE DISCUSSED AT SEMINARS: THE DATA BASE COMMITMENT      THE ROLE OF THE DATA BASE ADMINISTRATOR

#### MAKING THE DECISION

THE DATA BASE APPROACH—YES OR NO  
MAJOR ELEMENTS OF DATA BASE SYSTEMS  
EVALUATING COSTS AND BENEFITS

#### EVALUATING THE PACKAGES

IMS	TOTAL
ADABAS	\$2000

#### THE TECHNICAL ROLE

PROBLEM DEFINITION AND ANALYSIS  
FILE ORGANIZATION ISSUES

#### THE MANAGEMENT ROLE

POLICY MAKING RESPONSIBILITIES  
CONFIGURATION CONTROL

#### WHO IS PDC?

Performance Development Corporation is the only professional organization in the country concentrating the major portion of its talent in Data Base. In both public and in-house education. In design and implementation consulting. In preparing reports such as "Data Base Management Systems: A Critical and Comparative Analysis." In video courses and the "Data Base Newsletter." If it's data base, we're into it.

REGISTER NOW OR OBTAIN MORE INFORMATION BY COMPLETING AND MAILING COUPON—  
OR CALL 609-883-3707.

## PDC 32 Scotch Rd./Trenton, N.J. 08628

Please register \_\_\_\_\_ at \$95. per date(s) checked  
number attending

on left, for seminar(s), which includes complete working notes,  
papers and luncheon. Total fee is \$ \_\_\_\_\_

I'm interested. Rush more information.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE \_\_\_\_\_

Please bill my company.

Payment is enclosed.

ENTER MY SUBSCRIPTION FOR THE FREE "PDC DATA BASE NEWSLETTER."

## IBM 370's

are CSA's only business.

CSA is a computer leasing company, and can help you meet your present and future equipment needs with substantial savings.

For further information, please call (617) 482-4671

**Computer Systems  
of America, Inc.**

a computer equipment leasing company.  
141 Milk St. Boston, Mass. 02109

Send for the 12 questions you should ask of any leasing company before you lease.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

370 on order  installed

Model \_\_\_\_\_ Due Date \_\_\_\_\_

# data base: fact vs. fiction

### THE DATA BASE COMMITMENT

<input type="checkbox"/> OCT. 18, 1973	NEW YORK CITY
<input type="checkbox"/> OCT. 30, 1973	LOS ANGELES
<input type="checkbox"/> NOV. 13, 1973	CHICAGO
<input type="checkbox"/> NOV. 15, 1973	DALLAS

### THE ROLE OF THE DATA BASE ADMINISTRATOR

<input type="checkbox"/> OCT. 19, 1973	NEW YORK CITY
<input type="checkbox"/> OCT. 31, 1973	LOS ANGELES
<input type="checkbox"/> NOV. 14, 1973	CHICAGO
<input type="checkbox"/> NOV. 16, 1973	DALLAS

## Editorials

### 'Media' Implies a Medium

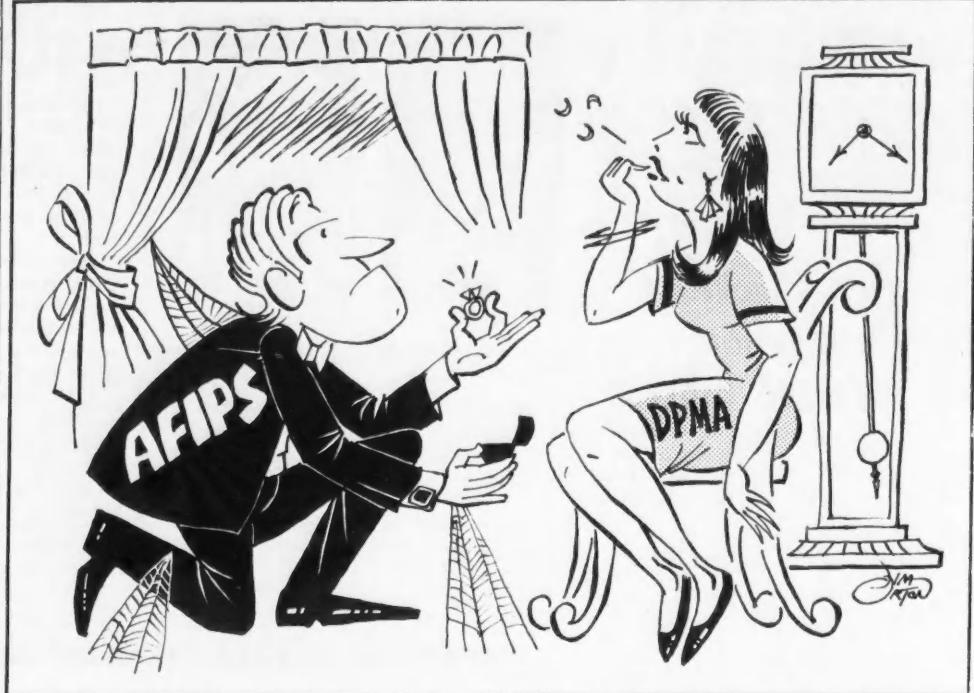
*Computerworld* is scouring the North American bush for paper supplies. We are struggling with newsprint shortages and the Canadian strike; as indicated elsewhere in this issue, business forms manufacturers are having problems with high-quality stock.

It all points up the continued importance of paper in a supposedly all-solid-state world. Space technology lets us call London or Lima via satellite, unimaginable to anyone except Arthur Clarke 20 years ago. But the telephone company still bills us on paper. And with a punched card!

### Guide Says No

*Computerworld* recently asked Share, Guide and Common to be allowed to peek under their respective tents. Perhaps the camel image associated with the CW Caravan, and nose thereof, militated against acceptance. Common refused quite promptly. We have just had a formal refusal from Guide. Nothing from Share so far; perhaps they have lost our address.

## How Much More Nail-Biting?



## Let Us Now Praise Systems Analyst, the Risk-Taker

By George K. Staropoli  
Special to Computerworld

If it were not for the insurmountable change affecting the user, systems analysts would not exist. It is the systems analyst who is responsible for the management and control of change – of the variety of conditions, events and developments affecting the firm.

The systems analyst is responsible for responding quickly and effectively to change in order to keep pace with the increasing competitiveness of today's business, and for developing a meaningful, effective and efficient system to enable the user to better meet his objectives.

His systematic approach, using the numerous management science techniques, provides the methodology by which he ar-

rives at the solution to the user's problems. Yet, there are still decisions that must be made, and risks to be taken in the exercise of judgment, that cannot be reduced to a systematic solution; namely, those questions arising from corporate policy interpretation, the relative importance of background material, the effects of changes and developments on the solution and the urgency of the solution.

How the systems analyst chooses to deal with these risks depends upon his environment and his own lifestyle. He may choose the safety of the bureaucrat or accept the challenge as an entrepreneur.

**Bureaucratic Systems Analyst**  
The bureaucratic systems de-

partment has its origins somewhere in the past when it went astray, perhaps leaning too much in one direction; such as building better mousetraps at exorbitant costs, or paying too little attention to the user's real wants.

The normal reaction is one of over-control, the preeminence of adhering to standards and procedures, the "review" that focuses on how well procedures were followed and the normalization and conformity of method, approach and thought. Raises and promotions are considered as compensation for work already performed. Results are measured in regard to policy, plans and procedures.

As for the analyst himself, he may have been caught out on a limb once, and now seeks the safety and low-level risk af-

firmed by a clearly defined book of rules – the systems and procedures manual.

The "what to do," "how to do it" and "why it should be done" are precisely defined by the requirements of the proposal study, report or specification documents.

"A study proposal must be submitted before . . ." and "We did not consider it because this problem was not specified in the study proposal" involve little risk-taking and conflict, for they are justified by recourse to "chapter and verse." To deviate from the established procedures is to assume an unnecessary risk, for the analyst is judged not by the results obtained in spite of the risk, but by adherence to standards. He is paid to follow orders and not to take risks.

If he fails in his calculated risk-taking, undertaken because the expected results justified the degree of risk assumed, he is ruined – his reasons are not recognized by management.

The lifestyle of the analyst is characterized by passivity, defensiveness, reaction rather than action, and "you get what you pay for from nine to five." He is a tired, unconcerned, "burned-out" analyst, whose visibility does not extend beyond the internal requirements of his department. His systems analysis and new systems design are just a scene instead of a scenario – he is not a visionary.

### Entrepreneur

In contrast to the bureaucrat, the entrepreneurial systems analyst seeks opportunities and is willing to accept well-calculated risks in order to bring economic benefits to his firm.

The opportunities and potential benefits lie outside the systems department and are depicted in the scenario of his study, reports, proposals and specifications. He insists on being measured in regard to results, not adherence to internal standards.

The entrepreneurial-oriented analyst is also a dynamic, imaginative innovator who identifies with and internalizes the ob-

jectives of the user. He exhibits a "we" rather than a "they" attitude.

Raises and promotions are considered by the analyst as an investment in his potential and not as a compensation for services performed. He is a costly resource to be fully utilized. When offered a challenge, he will respond.

There is a firm belief in management by objectives and an insistence on being measured by his success in meeting these objectives. For his reviews, he would rather submit a statement of his activities during the past year, including both quantified and impressionistic data.

This performance report would emphasize the results obtained in meeting his objectives and the significant decisions that had to be made. The analyst expects to be cross-examined, but not rated.

Being entrepreneurially oriented should not be associated with the permissiveness of "doing your own thing." The dynamic creativity of the analyst is under control throughout the development process; it is calculated to produce goal-satisfying results.

Management, if it is to respond rapidly and effectively to the variety of change affecting the firm's economic position, must seriously consider what it expects from its systems analysts.

The environment in which the analyst is to operate, as well as his approach, are factors that influence the systems department's ability to meet management's expectations. The question is: What does management want? Highly structured behavior patterns or highly successful business systems?

(The theme of this article had its origins in *Entrepreneurial Management*, Charles A. Dailey, McGraw-Hill, 1971.)

Staropoli is a systems analyst with the Chase Manhattan Bank.

**Editor's Note:** It is realized that Viewpoint articles by their very nature may be controversial. Readers are encouraged to comment on these articles, and to submit material on subjects that can affect EDP managers.

## The Social Cost of Data

Last week I attended a committee meeting of Safe, one of the IBM-sponsored projects on computer privacy and security. This particular one is based in the Department of Finance of the State of Illinois. I was allowed to contribute to the wide-ranging discussion, although I tried to be a good boy and not interfere with the real workers.

What impressed me enormously was the willingness of several of the senior people present, notably Ted Climis of IBM, to look at the total cost of data systems. Not just the obvious hardware, software and overhead costs; not just the startup and training and propaganda costs; not just the costs of transforming the business or the university or the government department as a result of analyzing the results – this group was willing to rather calmly discuss the social, the ecological, the antipollution costs of data.

Suppose a state motor vehicle bureau sells tapes of car and truck registrations to gadget vendors, insurance salesmen and the DAV. Suppose the sale is permitted by the absence of prohibiting law, or is explicitly sanctioned. And suppose that new privacy legislation requires expungable mailing lists, or even the securing of permission from the vehicle owner to be circularized. Obviously the cost of direct mailing will increase very considerably.

It was the consensus of our group that

the cost of using data in a socially acceptable way was, like the cost of antispill precautions in an offshore oil site, a necessary part of being in the data-consumption business.

We felt that the costs of privacy and security, the costs of treating the consumer with courtesy and with individual care, the costs of providing access and correction facilities for personal records, were necessary costs of using data; that private and public organizations should, and will ultimately be forced to, assume their fair share of these charges.

The idea is, of course, not new. I thought of Joe Weizenbaum as we talked, for instance. What impressed me was that not just computer people, not just senior business executives, but even lawyers were willing to discuss a Naderist issue. In this narrow but deep region of human concerns, all is not yet lost.



Herb Gross

# A Word About Microneumanns and Nanogrosches

By Michael F. Morris

Special to Computerworld

P.A. Zephyr's letter [CW, Aug. 29] commenting on my "speedometer" article [CW, July 25] goes directly to the heart of the matter.

We have no units with which to measure and we do indeed presume much when we call our subject a science. I think, though, we go too far when we begin a discussion of whose name we should honor before we have even thought about what our basic units should define, let alone what the units themselves will be.

I feel very pessimistic with regard to how soon we will have a "microneumann" or a "kilovonneumann," or, while we're playing, even a picozaphyr, nanogrosch or micromorris. I'm afraid we're so far from a unit for our "science" that all of these personalities and their great, great grandchildren will have long since been moved to "write-only" memory before anyone will need to worry whose name should be used for the basic unit.

My reason for believing this way has been put on paper already in a preface to a chapter on hardware monitoring in a

book titled *Computer Performance Evaluation* which Paul Roth and I are now writing for the Auerbach Publishing Co. The book will not be in print until mid-1974 so I will break the

power.

"Man's understanding of physical power is essentially total while of mental power we understand almost nothing. The 'Table of Selected Weights and Measures' in the Encyclopaedia Britannica (Vol 15, pp 138-142, 1957) lists nearly 400 units from "acre" to "zolotnik" that are now in international use."

"All are physical units. The closest thing to mental units are the units of MA and IQ scales. Both mental age and intelligence quotient are, at best, crude approximations of mental power. Neither has an independently definable basic unit."

"There is little or no ambiguity regarding the meaning of the information obtained through instruments developed to communicate performance of any type of machine that exists or that can be imagined — except one. Unfortunately, this one exception is computing machinery."

"It has long been a matter of historical interest that computers are truly unique among machines. All other machines serve to multiply physical power. Computers serve primarily to multiply mental

information obtained from such instruments enjoys a very high level of both acceptability and credibility for the philosophical reasons alluded to above. It must be understood that hardware monitors have no capability to measure that unique capacity which com-

puters provide to mankind.

"The basic issue of suitable units for describing computer performance may have to await resolution until fundamental discoveries are made that allow as complete a description of mental power as can already be made of physical power."

"One hopeful counterexample to this extremely pessimistic viewpoint might be made with electricity: even though no one knows what electricity is, there are basic units that adequately describe its performance and allow us to control it."

"However, electrical units describe only the physical characteristics of this power and it is difficult to imagine a mental characteristic describable in electrical units that would be within the bounds of 'respectable' science."

"Having spent perhaps too many words to make the point that computer performance evaluation is at least two levels of abstraction away from a well-founded measurement, no further space will be used addressing what should be the really basic issue. It is hoped that philosophers will do a better job with this issue when they have the time to devote to the con-

templation that practitioners can't afford."

"That's why I think Zephyr indeed saw through the trivia of the 'speedometer' article and put his finger squarely on the real problem of our 'science.' But, in the interest of not wasting the next few millenia on naming our unknown units, let's press on with potentially useful trivia until our real Volta, Watts and Ohms make themselves known to our descendants."

"One final item raised in Zephyr's letter: there is at least one effort under way toward the development of a sound theoretical foundation for our 'science.' Kenneth Kolence, co-founder and past president of Boole and Babbage, the software monitor firm, is developing an analogy to classical physics which he calls 'software physics.'

*Editor's note: CW is certainly aware of Kolence's "software physics" [CW, July 1], but he is reluctant to have a lot of coverage until he has completed a report for the National Bureau of Standards. He expects that to be done in early 1974.*

*(Michael F. Morris is with the Federal Computer Performance Evaluation and Simulation Center, Washington, D.C.)*

## Viewpoint

rules of good taste and humility and quote my own unrefereed manuscript:

"Instrumentation has been an integral part of virtually every complex machine devised by man. Measurement of the performance of machines is usually quite simple.

"There is little or no ambiguity regarding the meaning of the information obtained through instruments developed to communicate performance of any type of machine that exists or that can be imagined — except one. Unfortunately, this one exception is computing machinery."

"It has long been a matter of historical interest that computers are truly unique among machines. All other machines serve to multiply physical power. Computers serve primarily to multiply mental

information obtained from such instruments enjoys a very high level of both acceptability and credibility for the philosophical reasons alluded to above. It must be understood that hardware monitors have no capability to measure that unique capacity which com-

# Who Took My Cash? Was It Blue Cross or My Bank?

*A man once got up at a DPMA meeting I was addressing and told me I was a liar. "These computer mistakes you have been talking about," he said, "may have happened to different people around the country, but they all could not have happened to you. That's just not possible."*

*Well, I am sorry to say, in fact, they all happened to me. And while I strive to keep as far from computerized systems as possible, I still find the results of system errors and problems in my own mail far too often. Here is an account of some late developments just as they occurred.*

*Massachusetts Blue Cross & Blue Shield holds all my family medical insurance. A National Shawmut Association Bank handles all our banking business. As a result of past experience, I could never completely rely on what either of these firms said about my accounts and I have characterized their systems as both arrogant and inadequate to meet the needs of their subscribers and depositors.*

*What I had never realized until recently, however, was that these two systems can directly interact — and leave me knowing that one of them — I don't know which — has taken \$124.20 from me and left me uninsured.*

*I only found out about the whole matter by chance, three months after it actually happened. I was in the Blue Cross offices trying to clear up some charges that had been improp-*

erly rejected last January. The counter clerk told me my insurance had expired for non-payment some months ago. I hit the roof. Who wouldn't, in these days of high medical costs when

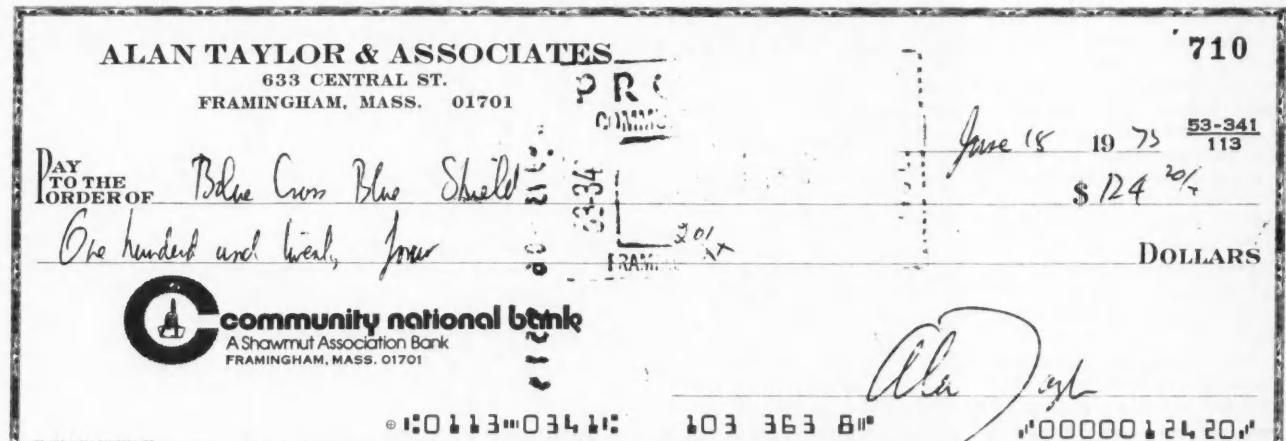
one relies upon insurance?

I was told Blue Cross would not let me see a list of the payments received on my account. The reason, according to the supervisor, was that it was

impossibly expensive to do this. The computers themselves could not hold the data, she said, and it involved searching microfilm records.

There was only one exception

to the rule, she told me. If the IRS officially requested a person's account with Blue Cross be searched, then it would be done for the IRS. But never for the



Massachusetts Blue Cross says it does not have my money — and the endorsement by the lockbox department of National Shawmut Bank does not positively acknowledge that the bank has it, although my records show I have paid Blue Cross.

Because of nonpayment, my insurance policies have been cancelled. Who has my money, and why did they not tell me that they have it? (After all, my address is on the check!)



## Who Took My Cash? Was It Blue Cross or My Bank?

(Continued from Page 11)

subscriber.

This rule is unfair. The Blue Cross system uses a single turnaround card which is marked, "This Notice Must Be Returned With Your Payment," so the records kept by the individual subscriber are inadequate at best. To be told that statements were not possible because of expense put an already arrogant system into the position of judge and jury in its own case.

If what she was saying was true, then I did not believe that we were getting proper service from the systems analysts; if it was yet another of those excuses which would ultimately be blamed upon computer errors, then we were not getting proper service from her department.

She did say how a subscriber was expected to check matters for himself. He was supposed to keep all his checks, and be able to produce them for Blue Cross inspection. I do not think this is adequate, when you think of the spectrum of insurance operations and subscribers, but I personally went home and checked mine. I had the missing check, and it was then I began to realize the true complexity of the situation.

That was when I realized I was dealing with two inadequate operations, not just one. And while I was trying to straighten matters, I was over a barrel as far as my insurance was concerned.

The next day, when I took the check to Blue Cross determined to see the supervisor or someone higher, I was refused access to anyone. The supervisor would not be in for three days. No replacement was at her desk. No junior staff could talk about anything she was dealing with. No senior staff would even be asked to see me. My insurance was cancelled and remained cancelled — because that was what the computers said.

My basic problem was that while I had the cancelled check, it had not been personally received by Blue Cross. I could not tell whether Blue Cross had in fact received the money. I still don't know. They may have it — or National Shawmut may have it or have given it to someone else. I can't prove anything because of the weakness of the National Shawmut's method of

handling lockbox accounts such as Blue Cross.

The idea of check endorsements is to prove clearly who has received the money. Normally endorsements are handwritten, or when handled in quantity they are rubber stamped. The endorsements given out to businesses by my local bank, for example, even include the account number.

But that is not the way the National Shawmut handles lockbox endorsements. To do that would cost them additional money — buying separate rubber stamps for each separate lockbox customer.

Instead, they prefer to use one standard stamp, "Credited to the account of payee," for all. This is not a receipt. It could have gone into almost any account and I would not know the difference. Any claim I might have against Blue Cross could be lost by the bank saying it had made a mistake, and offering me my premium back. A lot of good that would do to pay hospital bills!

As I went home, still with the check, and still uninsured, I called in on the local Kentucky Fried Chicken stand.

Here I watched what was later called "a programming error" —

a family was overcharged 20 cents, their protests disregarded. The automated cash register rang up \$6.69 for the Family Special. The price on the posters behind the register was \$6.49.

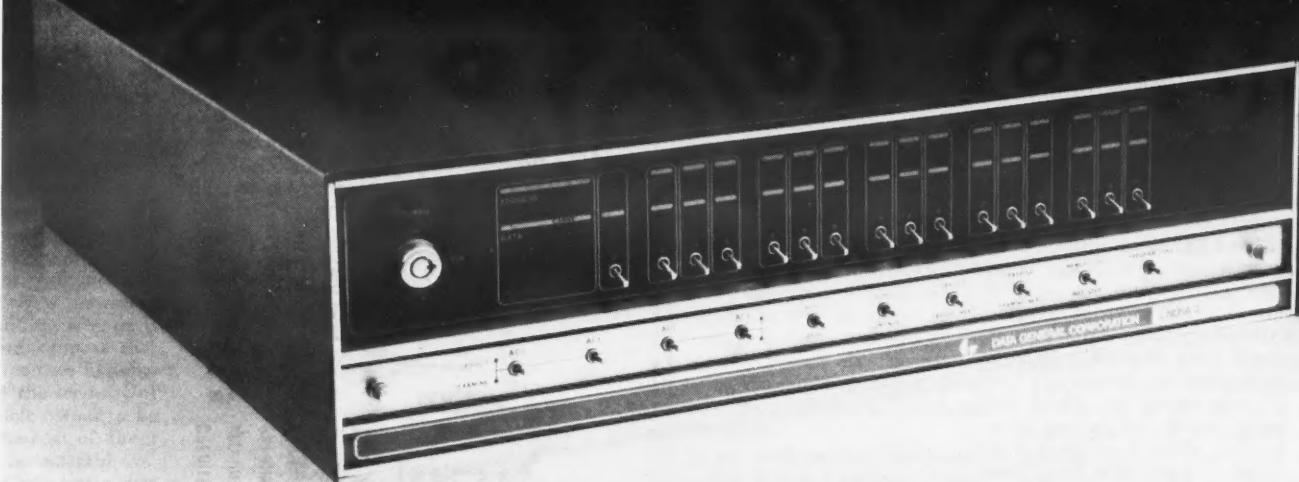
But the assistant and the customer both accepted the programmed display over the advertised price. The Colonel ended up richer because of that "programming error."

Perhaps this is the real reason for the continuation of the poor level of systems design and implementation, shown here in relationship to two large, thoroughly organized, systems users.

Perhaps it is cheaper for them to carry on mistakes and errors, and apologize about them when forced to, but profit from them otherwise. I can see how Blue Cross can profit from mistakes, and now after watching the 20 cent overcharge stay in Colonel Sanders' pocket, I am getting quite disturbed about the possibilities of abuse through system inadequacy.

© Copyright 1973 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

# The \$5,600 computer you don't have to talk down to.



**VOLUME  
KEY PUNCHING**  
(402) 346-0330



"JUST  
MINUTES  
AWAY"

**NOW**

**TWO LOCATIONS  
TO SERVE YOU . . .**

Omaha and now Ft. Worth, Texas.  
Fast, dependable service at low cost.

**AMERICANA  
KEY PUNCH**

General Offices

Redick Tower  
Omaha, Nebraska 68102  
and

1121 East Loop 820 S.  
Suite 401  
Ft. Worth, Texas  
(817) 457-1680

**Remember 1973?...**

## ...When ACM's Code of Ethics Caused 'Black Decade'

By Donald J. Kenney  
Special to Computerworld

ARMONK, N.Y., Oct. 17, 1983 — In late 1973 the Association for Computing Machinery officially adopted a code of professional ethics. Historians have now shown this code led directly to the market crash of 1975 and to the so-called "Black Decade" from which we are only now beginning to recover.

The code itself seemed innocuous enough. It required integrity, virtue, honesty, etc. from data processing professionals. It

had no more real substance or authority than the ethical codes for the medical, legal or automobile repairing professions. Under normal conditions, it would have been both ineffectual and harmless. But, those were not normal times.

The ACM code was caught up in the wave of reaction which swept the country as evidence mounted of malfeasance and corruption both in politics and within the DP industry.

In the reaction, the ACM code was formulated into law — the

worst, in retrospect, of the many laws (many good, a few bad) passed in that era. The first two states to include the ACM ethi-

### A Look Back?

cal code in its laws were Rhode Island and Minnesota. By May of 1974, 27 states had such a law. In the autumn of 1974, Congress added federal statutes to the list. The first known conviction

under these laws was obtained in Montana on April 26, 1974. Frederick J. Abernathy, Mountain States sales representative for Synergenics, Inc. of Palo Alto, Calif., was convicted of knowingly and willfully misrepresenting a Synergenics 2796-4 disk as being "plug-to-plug" compatible with the CDC 6200 when in fact only the plugs (Amphenol Type 519-31 pin) were compatible. He got five years and \$5,000.

Other arrests and convictions came thick and fast culminating

in November 1974 when the entire sales staff of the IBM Federal Systems Division was arrested by federal agents for conspiracy to violate Public Law 892-54 — intention to knowingly misrepresent the capabilities of an information system.

Although the case — known popularly as the trial of the Gaithersburg 5692 — was eventually thrown out of the Federal District Court in Baltimore, Md., due to a flaw in the arrest warrant, the message was clear — lying about hardware or software capabilities could get one in big trouble.

A second message took much longer to become clear. That was that even without lying competition, telling the truth about hardware and software capabilities sold about the same number of computers and programs it always had — next to none.

Actually, few prospective clients actually needed a computer, and once salesmen were forced to describe their products honestly, the customers were able to figure that out.

#### Lost Contracts

Many companies which had bought into contracts discovered they would have to take a far larger loss than anticipated (glossing over defects was good for five to 10 years and a substantial fine) and had little or no prospect for recovering their loss.

An observant individual would have noted a suspicious number of vacancies at the presidential and vice-presidential levels of EDP firms in the fall and early winter of 1974-75.

As with most such things, the evidence of disaster accumulated slowly. A few astute individuals observed the direction of the wind, cashed in their chips and got out of data processing.

By early 1975, the unemployment percentages began to creep upward fueled by flocks of unemployed programmers and engineers as well as those who had been displaced in other fields by

(Continued on Page 12)

#### For Lease

**Teletype\***  
**Model 33ASR**  
**with tape**  
**perforator**  
**and reader—**  
**\$53 per month.**

**Model 33KSR**  
**send/receive—**  
**\$39 per month.**

Available in any quantity  
for immediate delivery—  
includes nationwide  
maintenance service.

Call or write:  
RCA Service Company  
A Division of RCA  
Technical Products Service  
Bldg. 204-2, Camden, N.J. 08101  
Phone (609) 779-4129  
\*Registered trademark of Teletype Corp.

**RCA**

# The 16K Nova2 Data General

Southboro, Massachusetts 01772 (617) 485-9100.



DATA GENERAL CORPORATION • 1000 DEADERICK STREET • NEW YORK, NY 10016 • (212) 592-0400

Yes, I'd like to meet the ENTREX family of key-to-disk systems. Please tell me how we can get together and know each other better.

I'm interested in a demonstration  I'd like literature only

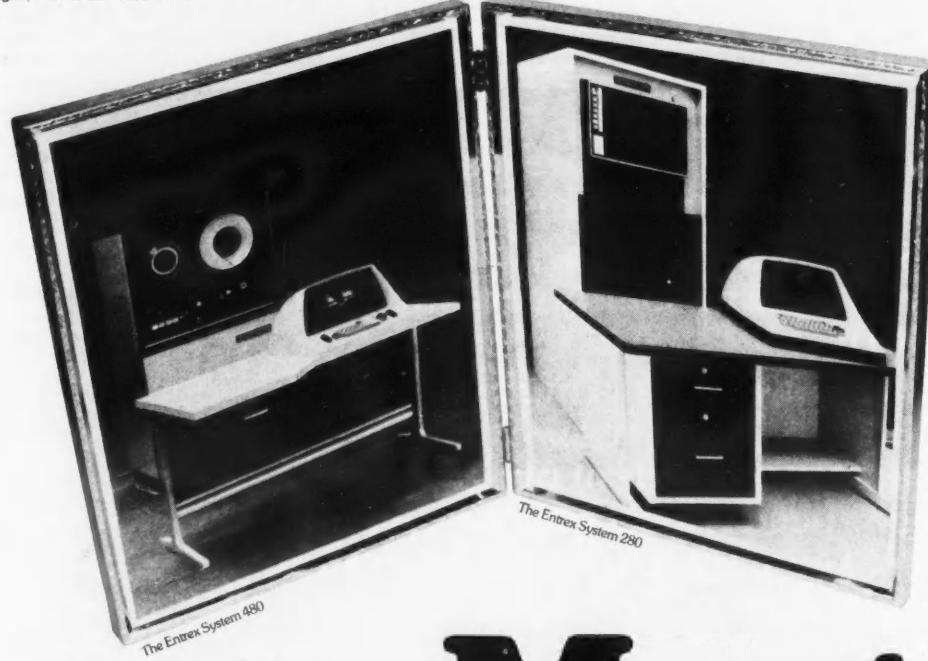
Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Telephone \_\_\_\_\_

**Sales Offices**

Atlanta	404/688-0482
Baltimore	301/997-3310
Boston	617/273-0480
Chicago	312/782-5427
Cincinnati	513/621-2387
Dallas	214/741-1140
Detroit	313/583-1760
Hartford	203/563-3866
Los Angeles	213/475-0480
Miami	305/949-4544
New York	212/682-2130
Philadelphia	215/265-2270
San Francisco	415/889-6580
Houston	713/777-2341
Toronto	416/493-9333

## ENTREX

168 Middlesex Turnpike, Burlington, Mass. 01803 617/273/0480



The ENTREX System 480 is the best thing yet in key-to-disk data entry. Its powerful processor provides up to 10,000,000 bytes of intermediate disk storage and controls up to 32 DATA/SCOPE keystations. It features an easy-to-use CRT and our exclusive HELP! key (notice how many look-alikes there are since we introduced the DATA/SCOPE three years ago?). Today, more than 200 System 480's, with more than 3,000 DATA/SCOPES are installed across the country.

And now we have even more to talk about. Our new System 280. It's ideal for the smaller user who needs only 1.8 million characters of intermediate disk storage and up to 8 DATA/SCOPES. Or the larger user who wants to perform remote data entry and communicate to System 480 or directly to the mainframe. Best of all, you can up-grade any time you desire, as all ENTREX systems are expandable by adding more disk capacity, more tape capability, even extra memory. Which means ENTREX systems are compatible . . . with each other . . . with your computer system. There's no generation gap in the ENTREX family!

We'd like you to meet the ENTREX family of outstanding key-to-disk systems. To get acquainted, just call or send in the coupon today. Once you get to know us, you'll agree . . . ENTREX has the answers in data entry!

# Meet the family.

## ACM Code Caused The 'Black Decade'

the few data processors who were fortunate enough to have talents, skills or family connections outside the EDP business.

Then the corporate reports began to come out showing evidence of disaster which even commonly accepted auditing practices could only partially mask. DP stocks slipped, slid, then, as the steady stream of bad news continued, crashed. IBM, at 419-1/2 in June of 1974, still stood at 411 on Jan. 1, 1975. On Jan. 15 it was at 388. On Feb. 1, at 358. On Feb. 15, at 306. On Feb. 19, it dropped 126 points from 297 to 171 before trading was halted. It reopened six days later at 194, gained five and promptly dropped 52 points. Other DP stocks did a great deal worse. IBM, after all, makes office equipment on the side.

Bankruptcies were widespread. Worse yet, prospects for DP firms were nonexistent.

Unfortunately, the DP industry had evolved to be far more extensive than most people had realized. Millions of Americans owed their living directly to computer-related jobs, and millions more were supported indirectly by EDP work.

The DP industry was every bit as much of a pillar of late 20th century society as was the automobile industry. When it collapsed, the society it supported collapsed. Despite the monetary shakedown of the early 1970s, the U.S. was still the leading economic force in the world. The stock market crash of 1975 led to a worldwide financial debacle including not only the capitalist world, but, to the surprise and chagrin of the communist world, the socialist and communist societies as well.

Once the nature and cause of the disaster became clear, attempts were made to recover. The ill-conceived ACM ethical code laws were, of course, repealed. But the magic was gone. Society was stuck on a skid into the depression of the later 1970s and the last thing anyone needed was an expensive computer, of dubious capability, to perform an unnecessary job. Humpty Dumpty was not about to be put together again.

We have now, most of us, survived the 1970s, and the economy appears to be on its way up. Our new society relegates computers to a minor and socially constructive role. Perhaps all this is to the good.

Yet one cannot but wish that the framers of the ACM code of professional ethics had been less concerned with ethics and honesty, and more conscious of their role as clowns and roustabouts in a circus — an entertainment which is, by its very nature, a deceit, albeit a harmless devise, and a thing which should never, never have been taken seriously.

## Who can sell computers in Japan?

In Japanese it's called **Shukan Computer**. In English, it means "Computer Weekly". Whatever you call it, it's an excellent vehicle for marketing EDP products and services to the second largest EDP market in the world (and the fastest growing).

A joint venture of **Computerworld** and Japan's leading electronics publisher, Dempa Publications, **Shukan Computer** is the first computer newsweekly for Japan. Its initial circulation of 35,000 is divided 80% to end-users and 20% to the computer industry, so Shukan goes to the people you want to reach

in a market which is growing at a rate of 23% a year in installed value. The latest census of general purpose systems revealed that there were 14,806 systems installed as of September, 1972, a 1-year gain of 3,569 units and \$911 million in installed value. 1972 imports were over \$360 million, so there is a lot of business being done by U.S. firms.

With **Computerworld** representatives across the U.S., it's easy to advertise in Shukan. Just send in the coupon. We'll send you media information and a free copy of our Market Briefing Bulletin: "EDP Marketing in Japan".

## Shukan.

To: **Neal Wilder, Vice President Marketing**  
**Computerworld**  
797 Washington Street  
Newton, Mass. 02160 (617) 965-5800

Please send me more information on **Shukan Computer** and marketing in Japan.

Name _____	Title _____	
Company _____		
Address _____		
City _____	State _____	Zip _____

## Get the news when it happens, not when it happens to get to you.

PLEASE CIRCLE 1 NUMBER IN EACH  
CATEGORY

**YOUR INDUSTRY**

- 01 Mining/Construction/ Oil & Refining
- 02 Manufacturing - Computer or data system hardware/peripherals/other associated mechanical devices
- 03 Manufacturing (other)
- 04 Utilities/Comm. Sys./Transportation
- 05 Wholesale/Retail
- 06 Finance/Insurance/Real Estate
- 07 DP Serv. Bureau/Software/Planning
- 08 Business Services (except DP)
- 09 Education/Medical/Legal
- 10 Federal, State and Local Government
- 12 Communications/Printing/Publishing
- 13 Other: \_\_\_\_\_

Please send me COMPUTERWORLD for 1 year and bill me later.

U.S. - \$9       Canada - \$10       Other foreign - \$25

First Initial	Middle Initial	Surname
Your Title		
Company Name		
Send to: Address		
City		

T - 340

State	Zip Code
Other: _____	



**COMPUTERWORLD**

Address shown is:  
 Business  
 Home

Check here if you do not  
wish to receive promotional  
mail from Computerworld.

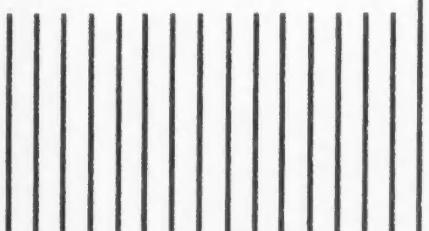
FIRST CLASS  
PERMIT NO. 40760  
NEWTON, MASS.

BUSINESS REPLY MAIL No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY



797 Washington Street  
Newton, Massachusetts 02160





Photographed on location at Glencoe, Scotland.

## When you need 3M's help, we'll call out the whole clan.

When you use "Scotch" computer tapes and disk packs, you get the combined skill and dedication of more than 1000 special people. The 3M Clan. People who have led the industry with innovations in computer media technology, starting with the development of the first computer tape in 1953. A clan which stands behind its products with one of the largest and most extensive groups of technical sales representatives in computer media. People who thrive on assisting. People who will go to any length to solve a customer's problem. The Data Recording Products Division of 3M. A proud clan.

"Scotch" is a registered trademark of 3M Company.



**3M**  
COMPANY

# IDMS-the way of the future in Data Base Management systems

We're sponsoring an extremely important seminar in Cleveland on October 31. If you're really interested in Data Base Management, you ought to attend. It will not be repeated until the Computer Caravan in the Spring.

At this seminar you'll get complete exposure to the new IDMS (Integrated Database Management System) which is the *only* system designed to meet a subset of the CODASYL Committee's Data Base Task Group Language Specifications available for IBM and UNIVAC SPECTRA equipment.

If (as many experts believe) the CODASYL Committee's Data Base Task Group specifications are the way of the future, then IDMS has to be the way of the future.

Performance figures in a number of installations where IDMS is working on regular production basis have already proven out the tremendous promise of this new system.

IDMS requires very little core (only 19 K) and little computer time. It has outstanding information retrieval capabilities based on the Cullinane CULPRIT system—which includes user department versions such as EDP-AUDITOR, MARKET-EDP-ANALYZER and others. These retrieval systems will handle all types of files and are not limited to IDMS files.

Other system details of importance are:

- Ability to create a variety of data structures according to user definitions:
  - hierarchies
  - tree structures
  - networks
  - unlimited combinations of the above.
- The system eliminates the need for redundant data.
- It requires no user intervention in maintaining data structure linkages.
- It protects against the storage of duplicate data.
- Control key modification automatically adjusts database relationships.
- The system gives user control over the physical placement of records.
- The system provides versatility in ordering a set of records. For example, ordering may be:
  - ascending or descending
  - first in, first out
  - last in, last out
  - user determined.

- The user has an unlimited number of entry points into the database.
- The system dynamically allocates and deallocates data storage space.
- Database can reside on 2311, 2314, or 3330 Direct Access Storage devices.
- IDMS eliminates the need for specified overflow areas.
- Available data storage space is perpetually inventoried.
- It uses flexible Data Description and Data Manipulation languages.
- The system offers flexible record retrieval.
- It permits movement through the database in any direction.
- It provides extensive error analysis.
- Data Manipulation Language interface with COBOL.
- Continuous journalizing of database for recovery purposes.

We'd like to emphasize that the above features are not theoretical — they have been well-proven in highly successful current use at multiple sites in BYC (Bet Your Company) applications.

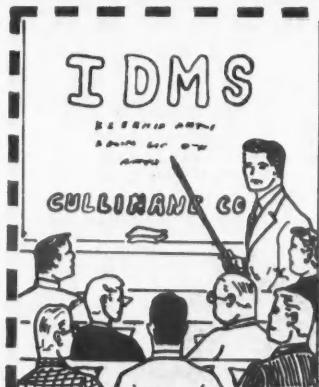
## The Seminar

Attendance will be limited to those who are really interested in Data Base Management, and by invitation. The date is Wednesday, October 31. The place is The Sheraton Hopkins Hotel, located at the Cleveland airport. The schedule includes:

October 30th	8:00 to 11:00 P.M.	Early arrivals hospitality suite.
October 31st	9:30 to 10:30 A.M.	CODASYL Data Base Task Group Specifications.
	10:30 to 10:45 A.M.	Coffee
	10:45 to 12:00	IDMS Technical Presentation, Part I
	1:00 to 2:00 P.M.	IDMS Technical Presentation, Part II
	2:00 to 3:00 P.M.	IDMS Workshop and User Experiences

If you are not able to attend, write or call for a technical brochure on IDMS.

## IDMS Seminar...Cleveland, Oct. 31.



Yes . . . reserve a place for me in the IDMS seminar. *I will make my own hotel reservations.*

No . . . I can't attend, but please do send me a brochure on IDMS.

Name / title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

(Mail to Cullinane Corporation or phone for an invitation.)

Cullinane  
Corporation

## Cullinane Corporation

One Boston Place, Boston, Mass. 02108 Phone: (617) 742-8656

# SOFTWARE & SERVICES

## Software Evaluation Strategy Aids User, Vendors

By Don Leavitt  
Of the CW Staff

CHICAGO — The disillusioned user of leased or purchased software should ask himself if he used the same rigorous procedures in selecting packages as he used in establishing the design, programming and implementation of in-house systems, according to technical analyst Paul R. Weininger of Washington National Insurance Co. (WNIC).

Speaking to the recent ICP Buyers' Seminar, Weininger said his company has learned to see and treat outside software vendors as one alternative to an in-house development effort.

WNIC doesn't allow software salesmen to make unscheduled presentations of their wares, Weininger said, since that wastes time and effort. "That translates into dollars and ultimately increases the cost of the package," he explained.

Instead, the company has set up guidelines that make sure it

has considered both in-house and outside resources.

### Help!

Under these guidelines, everything starts with a request for help from a user department, and the success of the approach was attributed by Weininger to the total and continuing user department approval and support, and definition and costing out of all tasks to be performed.

After project initiation and definition, WNIC goes through a system survey comparing the proposed system to the existing one, if any.

If the project still has a "go-ahead," Weininger's group estimates costs in time, resources and money needed to develop the proposed system in-house. Not until that base is established does WNIC even let outside vendors know it might be in the market for software.

The company sends out to every conceivable vendor — large

and small — a request for proposal (RFP). This provides the same system definition the company used to estimate in-house costs, and warns the vendor to respond, point by point, to those perceived needs, before "pitching" for any additional "bells-and-whistles."

The RFP also shuts the door on any presentation until WNIC has gone through its Software Evaluation Strategy, including the buildup of a "payoff matrix" to put all proposed systems on a standard comparable basis.

### Values Assigned

Each element in the system WNIC has defined is given a weight or value based on its rela-

tive importance. This assignment of base factors considers separately user or application elements and those are important to the DP installation.

Each of the responses to the RFP is rated by Weininger's group, but selection of the "best" systems for the final selection process is not based on these figures alone.

WNIC tries to determine what additional cost overhead must be paid if modifications are needed to bring the proposed system up to all of the RFP's original specifications. Here again, the company tries to estimate the cost two ways, in-house or vendor-provided.

Finally, each proposed system that survives the early evaluation

is benchmarked to show that it does in fact do what is claimed. And, after signing non-disclosure agreements, WNIC reviews at least parts of the actual source code and the documentation of the system.

After writing to current users of the proposed system and running financial checks on the vendors, WNIC then invites some to make in-house presentations. The benchmark, the documentation, user comments, the contract and final estimate of cost are all discussed during an all-day session.

With an approach such as this, Weininger concluded, WNIC is no longer faced with the threat of "buyer beware." Instead, the company has taken on a new maxim: "Buyer be aware."

## NCR Updates Century Operating System

DAYTON, Ohio — Users at the upper end of the NCR Century series have begun to receive a new release of control software from NCR, including enhancements to the previously available B3 operating system, and a completely new B4 operating system.

The B3 operating system is roughly comparable to IBM's DOS in overall capability. It has the potential to support nine relatively fixed partitions, though NCR spokesmen admitted that average usage has been "about three."

To the old system, NCR has added job accounting, unit and file sharing between partitions for the disk subsystems, and a more modular structure to the operating system itself. The modularity will mean that users, especially the smaller ones, will be able to pick and choose the features they want and not waste space on coding to support features they don't use.

The B4 system includes the same enhancements but is more strongly geared towards operator interaction with the job stream. It has "very good conversational" facilities allowing the opera-

tor to get status reports and other control information with the CRT that is part of the 251 and 300 console.

A Stage III ANS Cobol compiler (upgrading but not replacing the Stage II processor) and a Fortran E load-and-go compiler are included in the B4 environment. Stage III supports a broader subset of full ANS Cobol and includes internal Sort capabilities, NCR noted.

Stage II will continue to be supported for both maintenance of reported problems and utilization of new peripherals as they become available. However, no major new modules of language enhancements will be added to Stage II, the company said.

The new Fortran E is described by NCR as a "mini-Watfour" and is designed to support educational users where speed of compilation is more important than execution speed. The new load-and-go compiler is an addition to and not a replacement for the previously available Fortran IV processor.

The new release of the operating systems is being distributed free by NCR.

The new version of Total being developed by Cincom Systems will be installed and supported by Cincom with assistance from NCR personnel. Pricing is expected to be comparable to IBM-oriented versions of Total, according to an agreement between the two vendors.

## Wang 2200 Puts Payroll On-Line

TEWKSBURY, Mass. — Wang Computer Services (formerly PHI Computer Services) now has separately priced modules to enhance the PHI Payroll II system. The basic package has been undisturbed, the company noted, and will continue to be supported.

"Perhaps the most important new feature," a spokesman said, is support for on-line collection of payroll data utilizing the Wang 2200 calculator as an intelligent terminal.

Other options include a personnel data base information capture and reporting system; support for complete employee history records; and a labor cost subsystem that goes beyond the simple capability that has been part of the regular package.

The Wang 2200 is programmed in Basic so there is no need to learn any new language, the Wang source noted. And the calculator can be used in stand-alone mode for work unrelated to

payroll, alternately with the Payroll II support work.

The edited payroll data can be sent directly over communications lines to a central processor, or stored on optional cassette units.

The on-line linkup with the Payroll II application logic in the main CPU has been made possible, Wang said, through a rewrite of the Wybur teleprocessing software. Currently supporting only the Wang 2200, the software can probably be adapted to use other intelligent terminals as well, the firm added.

While the Wang 2200 logic is programmed by the user, the other new modules are "generated" through parameter-card entries. None of the optional capabilities takes core requirements that are significant compared to the basic Payroll II system. The modules range in cost from \$2,000 up.

Wang is at 836 North St., 01876.



## MMS General Ledger and Accts Payables Were Made for Each Other.

MMS General Ledger and Accounts Payables Corporate Financial Reporting Systems were designed to be installed separately or together. Either way, they're tailor-made for you. Together (or apart), they provide the most accurate, easy-to-use system available.

Best of all, they're ready to go any time you are — whether you use DOS, O/S, IMS or TOTAL. They're proven software packages, already hard at work for more than 100 US and overseas corporations.

Get to know the MMS General Ledger — world's No. 1 seller — and MMS Accounts Payables. A superb combination that's just right for you, too.

The MMS Corporate Financial Reporting Systems may have been made for us, too. Please send me more information about:

General Ledger    Accounts Payables    Accounts Receivable  
 Inventory Management    Payroll

name \_\_\_\_\_ title \_\_\_\_\_

company \_\_\_\_\_ street \_\_\_\_\_

city \_\_\_\_\_ state \_\_\_\_\_ zip \_\_\_\_\_ phone \_\_\_\_\_

Send to:  
**SOFTWARE INTERNATIONAL CORPORATION**

A Subsidiary of MMS, Inc.  
2 Elm Square, Andover, Mass. 01810 (617) 475-5040  
New York (212) 972-9540   Los Angeles (213) 437-3301  
Chicago (312) 729-7410   Atlanta (404) 255-0039



### LOW-PRICED acoustic coupler

MODEL 150 . . . NO FRILLS

- For use with all Series 33 TELETYPE Terminals.
- Half/full duplex switch.
- Carrier indicator.

\$147



**ComDATA** member of  
IDCMA  
7544 West Oakton Street  
Niles, Illinois 60648  
Phone: 312/692-6107

## If you're ready for data base management,

**SYSTEM  
2000**

### is ready for you.



Over a hundred SYSTEM 2000 users on IBM,  
UNIVAC, and CDC computers can back us up  
on that. TAKE A LOOK AT THE BENEFITS  
SYSTEM 2000 OFFERS YOU . . .

#### EASY TO USE

- Takes less time and cost to implement and maintain data base applications.
- Provides a user-oriented Data Definition Language for fast and easy start-ups.
- Allows quicker response to reporting and retrieval needs.
- English-like self-contained languages permit complete access to data; handle unexpected needs.
- Has powerful report writer.

#### MANAGEABLE

- Requires less user training — programmer and non-programmer.
- Reduces every kind of program and system maintenance cost.
- Provides maximum self-documentation.
- Easily used in batch, RJE, TP monitor, and timesharing environments.
- Has built-in data base security control.
- Built in restart and recovery capabilities.

#### FLEXIBLE

- Large or small data bases, batch or on line.
- Data compression and execution time trade-offs easily managed.
- COBOL, FORTRAN, and Assembly Languages for application programming.
- Data, program, and machine independence — responsive to change.
- Provides major facilities defined by the Data Base Task Group.
- Interfaces with major data communications control software.
- Hierarchical and network data relationships.

#### AVAILABLE — NOW

- Can be installed and operational in one day on your IBM, CDC or UNIVAC computer.
- Also available on COMNET, CYBERNET, INFONET and UCS computer networks.
- Available in the United States, Canada, Australia and 16 European countries.

#### SUPPORT COMMITMENT

- Comprehensive training programs and documentation.
- On-site installation assistance.
- Customer hot line service.
- Data base applications consulting.
- Continuing research and development.
- Full service maintenance.

**IF YOU'RE READY FOR DATA BASE MANAGEMENT,  
SYSTEM 2000 IS READY FOR YOU.**

**mri** SYSTEMS CORPORATION

Offices in: Atlanta, Austin, Detroit, Los Angeles, New York, San Francisco, Washington, D.C.

**CALL Dick Clikeman at 512/258-5171**

Telephone: 512/258-5171 Mailing Address: P.O. Box 9968 Austin, Texas 78766 TWX 910-874-1316 Cable: MRI

## Data Entry Package Adds Conditional Logic Tests

CUPERTINO, Calif. — Four-Phase Systems, Inc. has begun distribution of an enhanced Data IV/70, the key-to-disk software package provided with the company's intelligent terminal systems. The new version includes conditional data validation logic and expanded tape facilities.

The software supports communications with a remote IBM 360/370 concurrent with local key entry operations. Concurrent printing of data files, screen images and supervisory logs is now standard as well, the company said.

As with earlier editions of Data IV, Version 2 Release B is capable of handling up to 22 video terminals for use in keypunch replacement and source data entry applications. The addition of conditional logic, however, enables format programs to adapt themselves to conditions encountered during key entry operations.

#### IF Statements

IF tests can include an ELSE parameter so that users have considerable flexibility in directing the executing program to appropriate routines. The IF statement may be used with both single and nested expressions and these, a spokesman said, could reference previously entered fields, accumulator values, alphanumeric constants, value sets, or arithmetic and logical combinations of these.

The software also includes alpha string validation, logical AND and OR validation, format control of Automatic Skip/Duplicate and

format references of system keywords such as Julian day and batch number. Variable length records within a batch, ordered output of batch sequences, supervisory display of operator status and return to keying position are also supported.

New mag tape facilities include tape search, checkpoint/restart, support for multivolume tapes and variable blocked records. A new level of control has also been added to simplify operator handling of more conventional source documents, a Four-Phase spokesman noted.

The new Data IV/70 is being supplied free to all System IV/40 and System IV/70 intelligent terminal system users, he added, from 10420 N. Tantau Ave., 95014.

## Nine-Program System Controls Purchasing

WHITE PLAINS, N.Y. — Purchasing departments in a wide range of industries can improve their performance and profitability through a nine-program package from IBM. Used together, the programs are designed to help boost savings and give buyers more control over their responsibilities.

The programs focus on purchase order planning; quotation planning; requisition writing; purchase order release and maintenance; and purchase order status and review.

The purchase order program provides a choice of 12 predefined purchase order policies, or lets the user define his own for each product. The system can determine economic order policies and cash requirements, in the face of past-due open purchase orders.

The quotation planning elements of the package alert the buyer to missing or expired price quotations for items to be purchased in the future.

Requisition writing programs convert planned orders to open orders and prepare requisitions for those items designated by the buyer. Later the purchase order release and maintenance runs create a file to print orders, order alternatives and receiving packets.

The order status and review programs provide open order and exception as called for by the buyer. Orders that are closed or canceled are deleted from the active file. These programs and all others in the purchasing package provide user override to the "normal" action.

The entire purchasing package is written in PL/I and operates on 360/370 systems, requiring a 64K main memory for DOS implementation and a 146K or 170K partition/region under the MFT/MVT OS options. They will execute under a VS environment.

Purchasing is available as a program product under license agreements for \$300/mo (DOS) and \$450/mo (OS).

# COMMUNICATIONS

## As Fight Turns to State Level

# Only Users Can Stop Anti-Interconnection Forces

By Ronald A. Frank  
Of the CW Staff

WASHINGTON, D.C. — Users of customer-provided data equipment will suffer if a new effort to halt interconnection is successful. And the only way to stop this effort may be with a national users' organization.

The new attack on the use of non-carrier equipment will be waged on a state level and ostensibly will affect only intrastate services. But this is only a ploy of the common carriers and regulators — in fact all interconnection customers will be hurt.

The latest challenge to interconnection is essentially a replay of states' rights vs. federal authority. With the government having firmly advocated the use of non-carrier equipment through the well-known Carterfone and other FCC decisions, the common carriers have regrouped to fight another delaying action in the states.

And now instead of resisting integration, we find North Carolina resisting interconnection.

But why did this southern state, seemingly removed from the mainstream of communications action, propose to eliminate intrastate interconnection in November? It is doubtful that the concept originated entirely within the state's utility commission.

The world since Carterfone has been a frustrating one for the phone companies. After first being told they had to allow customer-provided equipment on their lines, they next learned they would have to compete with the specialized carriers for private-line users.

The established carriers soon found the FCC had little compassion for their cries about the dangers of competition.

Bell and most of the other carriers have

always had things their own way. When two carriers provided similar services, they usually did so at rates which were very similar.

So Bell began to look for help by appealing to the state regulators. The state commissions had cause to listen. They felt bypassed by the FCC on vital issues that were changing previous restrictions on communications users, right in their own backyards.

One of the most powerful regulatory organizations is the National Association of Regulatory Utilities Commissions (Naruc). It succeeded in lobbying for a joint board which includes Naruc representatives.

This board has been empowered to review and make recommendations on major FCC proposals that will impact intrastate users.

But while the joint board was waiting for FCC advisory groups on interconnection to make recommendations, more and more users began to install non-carrier equipment.

And since the same facilities used for interstate communications services also are utilized for intrastate uses, the state regulators became concerned.

There is no mystery about why Bell is now taking its case to the state regulatory agencies. For it was Naruc that issued a court challenge to the famous specialized

carrier decision. It asked to overturn the decision also in a state removed from most communications traffic, the state of Washington.

In addition to a proposed halt to intra-state interconnection in North Carolina, the Nebraska Attorney General has issued

## Analysis

an opinion that vendors who provide and install equipment attached to the phone network should be regulated just like the phone companies. This would make non-carrier suppliers file tariffs for their equipment. A similar bill has been proposed in the Minnesota legislature.

Communications users always find themselves at a disadvantage when it comes to regulatory issues. They have to be more concerned with running cost-effective networks.

It is true that regulatory proceedings are long, drawn-out affairs which are fought by high-priced legal experts. Most users have neither the time nor the money to become involved.

But the result of these proceedings does affect the user's pocketbook. The Carterfone case has made it possible to get a non-carrier modem and the specialized carrier decision has made it possible for private-line users to get non-Bell facilities.

And in both areas, innovative users are enjoying considerable savings.

What is needed is a national users' organization that has the power to speak out for its members. The problem is difficult because both interconnection firms and the specialized carriers serve data and voice users.

Some groups represent only the vendors, some speak out only for the voice telephone customer. And a few groups try to be all things to all people by speaking for both vendors and users.

There is virtually no group which can speak for the data communications user on both the national and state level.

The major user organizations, such as the International Communications Association (ICA) and Tele-Communications Association (TCA), are taking steps to change this. TCA members recently changed their by-laws so the organization can speak out on important issues with the approval of the membership.

But these groups are administrated by users who serve part-time to whatever extent their companies will tolerate.

A strong, full-time user organization would complement existing efforts. It is time data users take the necessary formative steps in this direction.

The important regulatory issues should not be hashed out between the carriers and the vendors. The data users must speak out to protect their interests.

## Telenet Files for Value-Added Network

By Patrick Ward  
Of the CW Staff

WASHINGTON, D.C. — Telenet Communications Corp. has filed an application with the FCC to establish and operate a "value-added" network based on

the "packet switching" technology now being used in the Department of Defense's Arpanet.

Packet Communications Inc. filed an application with the FCC to establish a similar type of network last January.

Telenet, a Bolt Beranek and Newman subsidiary, plans to use land-based and satellite communications channels leased from other carriers. The value-added carrier's customers will connect their computers and terminals to Telenet switching centers where minicomputers will divide the data into "packets" which are information pieces consisting of up to 1,000 bits. These will be dynamically routed along one of several paths.

Telenet officials said this routing technique will minimize end-to-end transmission delay, ensure accurate delivery, spread traffic evenly throughout a network and increase line utilization and system reliability.

The system would offer users effective interconnection between dissimilar computers and terminals by providing code, speed and format changes within the network. Automatic error-correcting techniques, also within the net, would reduce

errors, the firm stated.

Usage charges to customers will be based on the volume of data, independent of distance. The proposed rate charge favors high-volume users, with rates ranging from \$4 per 1,000 packets to \$0.48 per 1,000 packets, depending on total monthly traffic for each subscriber computer. Nighttime usage prices will be halved.

Computer connection links to the Telenet central office will range from \$500 to \$4,500/mo for leased lines of from 4,800- to 50,000 bit/sec capacity.

Terminal connections will be priced on transmission speed, but customers may use either dial-in or dedicated lines. Dial-in usage will cost from \$0.50- to \$2/hour.

Telenet's charge for dedicated terminal connection will range from \$50- to \$200/mo, depending on transmission speed and not including the cost of the leased line, which Telenet stated it will provide to the customer at cost.

Telenet plans to initially build central offices with interface message processors (IMPs) and terminal interface processors (TIPs) in 18 cities with operation to begin within 18 to 21 months after an FCC permit.

## Specialized Carriers Exchange Land-Based, Space Facilities

SAN DIEGO, Calif. — One of the subjects most on the minds of users attending the Annual Conference of the Telecommunications Association was the emergence in the private-line area of the new specialized carriers.

Most of the specialized carriers were represented at the conference exhibition along with companies planning to offer domestic satellite services to users.

Southern Pacific Communications Co., one of the new carriers, and Western Union Telegraph Co. announced an agreement to exchange satellite and land microwave facilities to speed service to users.

SPCC will use facilities of the WU

Westar satellite to expand its network to the East Coast while WU will utilize SPCC lines in the Southwest to provide service in Dallas, Houston, Austin and San Antonio. Westar is scheduled for launch in April 1974.

American Satellite Corp. announced an agreement with Western Tele-Communications Inc. to integrate certain facilities under a seven-year lease. Under the agreement, WTCI will lease "space and ground segment duplex circuits" from American Satellite.

In addition, American Satellite will acquire a California earth station site from WTCI, and Western will build ground facilities to American's offices in Los Angeles.

## The ADAC 1200 gives you MORE than a HIGH SPEED acoustic coupler.

The ADAC 1200 gives you the combination of an acoustic coupler for immediate portability, plus a data access modem for fixed installations. And you get compatibility with—Bell System 202C Data Sets, Bell System Data Access Arrangement (DAA—CDT-1000A) and EIA RS232B/C devices. There's more to say about the ADAC 1200 and we say it in a data sheet that will go to

you the day we receive your coupon.

But please remember, the ADAC 1200 is by no means our only product . . . we offer non-impact printers, Teletype and Selectric terminals, cassette recorders, and other couplers and modem systems, plus our own sales and service staff in over 30 cities, plus the option to buy or lease. That's why we're . . .

Advertising Dept., Anderson Jacobson, Inc.  
1065 Morse Ave., Sunnyvale, California 94086

- Send me the ADAC 1200 Data Sheet
- Send me info on your other couplers
- Have someone contact me

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

TELEPHONE \_\_\_\_\_

More than a coupler company

**JL Anderson Jacobson**

1065 Morse Ave. ■ Sunnyvale, CA 94086 ■ (408) 734-4030  
Sales offices in principal cities throughout the U.S.A.



## DATA NETWORK FOR SHARE

Nationwide private line full duplex network serving 58 cities in 29 states. AVAILABLE for dedicated use between 7 P.M. and 7 A.M. E.S.T., 24 hours for multiprocessing, or utilization of unused bandwidth. Available in whole or part with facilities management.

CW Box 3850  
797 Washington St.  
Newton, Mass. 02160

## System/370 LEASES

■ LOWEST RATES ■ BEST TERMS  
**COMPUTER MARKETING INC.**

7704 Seminole Avenue  
Mellrose Park, Pa. 19126

CALL:  
(215) 635-6112

## RBT

In the good old days, it was RFD. Today, it's RBT . . . the INCOTERM® SPD® 900 Remote Batch Terminal Systems. They deliver.

And because of INCOTERM "push-button" compatibility, what you receive is a bundle of unsurpassed user options. You can mix and match . . . with batch . . . and interactive. Select 2780, 3780, and 2740, 360/20 and 2265, 1004 and Uniscope 100, 200 User Terminal and Series 710. You can interface with your CPU, with your service bureau . . . or with a combination of multiple CPU's or service bureaus.

You get card reading at 150 or 300 cpm and printing at 200 or 400 lpm. And if you want a lot of storage for programs, formats, or data, choose

### Cool to Moratorium

## 'Why Halt Competition?': Users at TCA

By a CW Staff Writer

SAN DIEGO, Calif. — Users attending the recent Tele-Communications Association (TCA) conference heard an AT&T official suggest a moratorium on all competitive data transmission services now challenging Bell.

But most of the attendees surveyed were quick to object, and some questioned Bell's motives in trying to limit open competition.

Lucky Marr, corporate communications manager, Bechtel Corp., and vice-president of TCA, summed it up when he called the concept "terrible."

"We are now planning an advanced network using our own computer-controlled applications in key areas. We plan to use the equipment of a small non-carrier company, but AT&T is using its immense power in a direct frontal attack on the little user."

Bob Guaspari, director of communications, County of Ventura, Calif., wasn't concerned, but he has an ace up his sleeve: "We have our own microwave equipment, and we have a request in for an LEAA grant under which we would buy our own transmission equipment."

Ken Watts, manager of telecommunications, Fireman's Fund American Insurance Companies, on the other hand, was concerned: "It would cause problems as far as competitive pricing goes. Competition is definitely helping to get prices down."

"Everybody is reviewing their equipment costs and other manufacturers' modems have given us higher quality transmission at less cost plus the right to own equipment instead of leasing it."

Although Merle Breeden, superintendent of communications, Santa Fe Railway Co., also runs a private communications network, he termed the proposed moratorium "delaying tactics."

"I like to see competition and see these companies develop. What has been started, should be allowed to continue. We run data on our system and our non-carrier equipment has been the same quality as that supplied by Bell," Breeden said.

Jack Fetzer, Lockheed Aircraft Corp.'s manager of communications services, agreed and hoped that this move by Bell would not force communications users to be "stuck with the status quo for an indefinite period."

"It seems strange to call a halt before competition really gets off the ground. I just don't believe the specialized carriers will harm Bell that much," he added.

## Rule Change Permits TCA to Take Stands

SAN DIEGO, Calif. — The Tele-Communications Association may soon become involved in important issues confronting data and other users, according to the organization's incoming president.

A recent change in TCA by-laws will now allow the user group to take a position and represent the views of its membership, explained Stephan Ernst, chief analyst for communications and equipment research at The Bank of America.

As the new head of TCA, Ernst said he hopes the user organization will speak out on issues such as interconnection and the specialized common carriers, perhaps as early as the end of this year.

The change in its rules will allow TCA to issue a public statement when two-thirds of the membership at a special meeting approves such a move, Ernst said. One stipulation in this process calls for publication of the way members voted, "So that everybody's opinions are clearly indicated," he said.

## 'Universal Terminal' Uses Microprocessor

FOSTER CITY, Calif. — A "universal" interactive typewriter terminal from Gencom Systems, Inc. incorporates both an Intel MCS 4 microprocessor and a Diablo type print mechanism.

The terminal is universal in the sense that while its standard code is ASCII, users can order an optional version that is switch-selectable to EBCDIC, Correspondence or Baudot codes. In addition, the terminal's programmable read-only memory (PROM) can be modified, at extra charge, to accept the user's particular control codes.

### Character to Plot

The terminal will switch from character mode to plot mode when the operator CPU issues a control F. The next control F would revert it to character mode.

Optional single or dual tape cassettes give the unit ASR capability. The terminal transmits at speeds of 100, 150 or 300 bit/sec. There is a 128-character buffer.

The terminal provides RS 232 and TTY interfaces as standard equipment, as well as a 10-key numeric pad.

First installations of the GSI 300 have been made. The terminal costs \$3,950 or leases at \$155/mo. with maintenance, from the company at 1181 Chess Drive, 94404.



# SYSTEMS & PERIPHERALS

## A \$13 Million 'Steel'

NEW YORK — The Securities Industry Automation Corp. (Siac) expects to reduce computer costs by \$13 million over the next seven years by consolidating equipment and locations and obtaining more favorable leasing contracts.

The computer arm of the New York and American Stock Exchanges forecasts savings of nearly \$5 million from the decision to lease two IBM 360/50 computers for seven years from the U.S. Steel Leasing Co. The Model 50s will replace systems previously rented from IBM on a monthly basis.

Under IBM terms, Siac would have paid in excess of \$10 million in rental charges over the next seven years; under the U.S. Steel Leasing agreement, the seven-year cost will be about \$5.4 million.

Last fall, Siac signed a leasing agreement with Itel, Inc. for two IBM 370/155 computers. That agreement resulted in a \$2.3-million savings (for the five-year term of the lease) over the rental cost from IBM.

In a further move to reduce costs, Siac has consolidated its seven computer centers into four, reducing the amount of peripheral equipment needed for efficient processing.

At the same time, Siac said it has obtained new, more favorable contracts for peripherals.

The consolidation and peripherals contracts will result in an additional savings of \$5.9 million in seven years, the organization said.

## Calcomp Tape Units Lure Univac Users

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) has unveiled a new series of magnetic tape transports designed to lure Univac 400 and 1100 computer users away from Univac's Uniservo 20, 16C, 12C, VIIIC and VIC tape units.

The plug-compatible 8820 Magnetic Tape System is composed of the 8820 tape controller and from one to 16 300 Series tape units in any combination of models 316 and 320.

The 8820 connects to the word-parallel interface of the Univac central processor to control tape units with 9-track single- and dual-density and 7-track features.

With the single-density feature, operating mode is 1,600 bit/in. phase-encoded. With the addition of the dual-density and 7-track feature, the 8820 can accommodate 9-track 1,600 bit/in. phase-encoded or 800 bit/in. NRZI, as well as 7-track 556/800 bit/in. NRZI tapes.

All data transfers are in the burst mode with the 8820 executing one command on one tape unit at a time, a spokesman said.

The controller checks parity on each byte. On write operations, parity errors are detected and corrected before the byte is sent to the tape unit. On read operations, parity errors are corrected before the byte is sent to the selector channel.

In addition to error detection

and single-track error correction, a phase-encoding error correction is included.

A switchboard-like tape unit interface on the controller permits individual tape units to be switched out or physically removed without affecting operation, a spokesman said.

### 300 Series Tape Units

Both the Model 316 — operating at 125 in./sec — and the Model 320 — at 200 in./sec — are plug-compatible with all models of the Univac 1100 and 400 series.

Features available on the tape units include:

- Feature 8401: single-density

1,600 bit/in. phase-encoded 9-track operation.

- Feature 8402: dual density 1,600 bit/in. phase-encoded and 800 bit/in. NRZI 9-track operation.

- Feature 8403: 7-track 200, 556, 800 bit/in. NRZI 7-track operation.

- Feature 8404: dual access and simultaneous read/write operations on any two tape units.

Purchase price for a typical system consisting of controller and six Model 316 single-density 1,600 bit/in. drives is \$125,700 plus maintenance. Leasing arrangements are also available. Calcomp is located at 2411 West La Palma Ave., 92801.

## Varian 620s Gain Direct-Access Tapes

BELTSVILLE, Md. — Linc tape direct access mass memory has been announced for the Varian 620 minicomputer.

Linc tape is essentially a "disk on tape," according to the developer, Computer Operations, Inc., in that "it appears to the

CPU as a disk providing the capability to overwrite in place on directly addressable blocks without disturbing adjacent data."

Transfer rate is 8.4 kbyte/sec with reels containing either 205K or 336K bytes of data in

blocks of 512 bytes.

Operating software includes a text editor, DAS assembler, file management programs and loaders.

Cost for the Model CO-500VP is \$3,950 and includes a program-controlled master Linc Tape system for the Varian 620 and 73.

The Model CO-500VA consists of a direct memory access master Linc Tape system for the 620 and 73 series minicomputers. It uses only one I/O slot and costs \$4,950.

Computer Operations is located at 10774 Tucker St., 20705.

## Printer/Plotter Brochure Available

CUPERTINO, Calif. — Users thinking of acquiring matrix electrostatic printers and/or plotters can obtain a technical bulletin from Versatec, Inc. describing the interfacing of these units to various computers.

The bulletin describes the basic

interface in detail and includes pin connection lists and timing diagrams. Also discussed are print, plot and simultaneous print/plot operations.

Copies of the bulletin can be obtained from the firm at 10100 Bubb Road, 95014.

proprietary software that could take raw accounting information and produce balance sheets, profit and loss statements, general ledger and other accounting items.

The system grew to the point where it was servicing about 120 private accountants with no impact on the central system.

"The problems were with the information the accountants prepared and transmitted for processing," Hosbein stated.

For many years Friden or Burroughs add-punch machines were used to produce the raw data on paper tapes.

The difficulty arose because data had to be punched in strict formats, using zeros to fill out unused columns. Errors were compounded because, "if the accountant did make a mistake, he could not tell from proofreading the holes in the finished tape," Hosbein said.

### Three in One

With Porta-Verters in the accountants' offices, "they have three machines in one: a standard adding machine, a digital cassette tape recording system and an on-line terminal," Hosbein stated.

Now the accountants enter figures directly through the adding machine keyboard, and there is no need to zero fill or truncate.

"With the cassette tape the accountant can stop anytime, take his tape out and know when he comes back he will be able to start right in again. All he has to do is to command a search to last block, and the Porta-Verter's printing unit will print out the last record entered. Further editing functions allow the accountant to change records that are incorrect," he said.

Once a cassette tape is complete, the accountant inserts the phone hand set and transmits the data to the central computer for processing. "Our tests have shown that this method of transmission is four times faster than a standard teletype transmission," Hosbein added.

"Yet with this improved capability the Porta-Verter cost us \$2,395 each compared with the older Burroughs and Friden units which cost around \$2,700 when we bought them," he noted.

## HOW TO PASS THE C.D.P. EXAM

ONLY \$8.95

534 Pages



## BUY THOMAS J. CASHMAN'S ORIGINAL REVIEW MANUAL for C.D.P. USED BY THOUSANDS TO PASS THE C.D.P. EXAM SINCE 1964

1120 E. Ash • Fullerton, Ca. 92631  
 CHECK ENCLOSED  SEND C.O.D.  
Please check the Data Processing Books.  
PLUS POSTAGE & HANDLING 55¢ EACH.  
STATE TAX IF APPLICABLE.

### CASHMAN/SHELLY BOOKS

<input type="checkbox"/> Review Manual for Certificate in Data Processing .....	\$8.95
<input type="checkbox"/> Intro to Prog System/360 Assembler .....	\$7.95
<input type="checkbox"/> Advanced Assembler - Disk/Tape .....	\$8.95
<input type="checkbox"/> DOS Job Control Assembler .....	\$6.95
<input type="checkbox"/> Intro to Prog ANSI COBOL .....	\$8.95
<input type="checkbox"/> Intro to Programming RPG .....	\$9.95
<input type="checkbox"/> Intro to Programming PL/I .....	\$8.95



ANAHEIM PUBLISHING CO.  
NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

## Machine And Handprint Recognized

# Optical Data Entry System 'Replaces 12 Keypunches'

By Michael Weinstein

Of the CW Staff

PALO ALTO, Calif. — Replace 12 keypunches and their operators with one Optical Character Recognition (OCR) unit is the message behind the release of Data Recognition's new ADES-1.

The ADES-1 is designed to convert numeric data from handwritten documents to computer compatible input of magnetic tape, floppy disk or Micr impressions in one pass.

This one pass capability con-

trasts with some operations where computer input is prepared three times — by the personnel entering source data on a form, at computer input station by operators... and by operators verifying the input.

The ADES-1 converts data from source documents at a rate of 40 char./sec for handwritten numerics up to 250 char./sec for standard printed type fonts; seven fonts are available.

Logic and systems control is provided by a resident program prepared for each user's applica-

tion prior to shipment.

These user specified programs read specified fonts; select pertinent data fields; and control various I/O functions.

Internal memory capacity for operation control and single font capability is 16K bytes, but is expandable to 64K bytes. About 4K bytes additional memory is required for each added font capability.

Users can expand output stackers from the basic four to a maximum of 32 in modules of four.

Each output stacker is accompanied by a 12 column stacker printer to list data, indicate number of documents containing scannable, as well as unscannable data, and batch totals under program control.

The ADES-1 is available in reading capacities from one to six lines with maximum reading line length at 8-1/4 in. Documents containing mixed, handwritten and machine fonts are readable on one pass.

A nine-channel 800 bit/in. tape drive is standard with a 1,600

bit/in. unit also available.

For banking operations, a Micr encoder encodes data back onto processed checks.

Users can obtain on-line storage capability by use of the optional 3M bit floppy disk drive.

The floppy disk is capable of recording all data read by the scanner. Second entry is made by interrogating the diskette subsystem through a video display unit.

In this manner, the diskette subsystem can be used for applications with a significant volume of unrecognizable input and variable input not contained on source documents, the spokesman said.

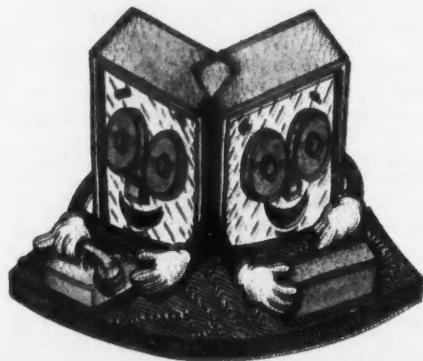
A 20 column master impact printer can be added to provide hard copy of all data converted to computer input media.

Price of the system depends on each user's specific requirements, the spokesman said, but prices range between \$72,500 to \$170,000. Typical systems cost between \$85,000 and \$105,000.

Data Recognition is located at 908 Industrial Ave., 94303.

## Now you can have key-to-disk and RJE going in one system.

### Concurrently.



System 2400 invites you to forget scheduling hassles.

You can have an RJE terminal available full time. You can access about any major mainframe you wish, and do it at speeds as fast as your communication lines can move the bytes.

At the same time, your operators can key data to disk uninterrupted. From up to 24 stations. With all the efficiencies of tutorial key display and edit-as-you-go intelligence, of course.

Consider it two systems for the rental of one, because that's what System 2400 delivers.

Consider, too, the other System 2400 options for your RJE site. On- or offline printing, editing, media conversion, your own programming. They're all available today or as you need them with a minimum of added hardware and a growing library of software.

System 2400 goes together your way, so you master today's needs and are more than ready for tomorrow's.

Call us, and we'll put it all in terms of your requirements. That's how MDS has grown to have a user list second only to IBM. Phone your local MDS representative or call headquarters at (315) 792-2424. Mohawk Data Sciences Corp., Utica, N.Y. 13503.

## HP Offers Better Floating Point

PALO ALTO, Calif. — Hewlett-Packard 2100 users can obtain a microprogrammed floating-point capability through a read-only memory (ROM) that plugs directly into the user-accessible microprocessor of the computer.

The new floating-point microprogrammed capability is five to 20 times faster than if floating-point operations were handled from core memory, and it costs 80% less than the previously available floating point for the 2100, HP said.

The floating point microcode is held in a 256-word read-only memory. This microcode gives users the ability to add, subtract, multiply and divide numbers in scientific notation and to convert from fixed to floating point and vice versa.

Internal speed of the microprocessor is 196 nsec compared with memory cycle time for main core memory of 980 nsec.

Thus, the microprocessor can perform five microcoded instructions in the same time period it takes main core memory to perform one operation.

In one 196-nsec time period the contents of two different registers could be put through the arithmetic unit and the sum written into a third register.

The move to ROM has allowed HP to reduce the cost for floating point to \$500.

The firm is at 1501 Page Mill Road, 94304.

## REPLACEMENT FOR IBM 1133-2310

Full Hardware  
Compatibility

7X Seeking Speed  
\$380/month Rent  
\$6,500 Purchase  
(916) 489-4745

**System 2400.**  
It earns its place  
between you and your mainframe.

**Mohawk Data Sciences**

## Asis '73 Schedules 3 Debates

LOS ANGELES — Should the American Society for Information Science (Asis) go on record as advocating the certification of information scientists and prepare a program to achieve certification in 1976?

The answer to this question may result from a formal debate scheduled during the 36th Annual Asis meeting, Oct. 21-25.

### Societies/ User Groups

at the Hilton Hotel here.

Two other debates are slated for the conference. The first, dealing with the question of copyrights, will be aimed at deciding whether it should be considered infringement for research purposes to make copies of all or parts of publications resulting from work supported partly or

### Registration Closes Early for Datacomm

ST. PETERSBURG BEACH, Fla. — Due to the heavy advance interest, registration for the Third Data Communications Symposium — Datacomm'73 — will close Nov. 2, according to officials.

The symposium, sponsored by IEEE/CS and ACM/Sigcomm, will feature six non-parallel sessions: Performance of Computer Communication Systems; Issues in Data Network Design; Network Control — Signaling, Multiplexing and Message Handling; The Network Interface — Packet Switching; Teleprocessing Network Analysis and Design; and Reliability of Networks.

A pre-symposium tutorial on data networks will be held Nov. 12 to provide an overview and a survey of the technical aspects of data networks. Topics will include routing and flow control, network design algorithms, and multiplexers, concentrators and network optimization.

Further information on Datacomm'73, which will be held Nov. 13-15 at the Happy Dolphin Inn here, is available from Third Data Communications Symposium, P.O. Box 639, Silver Spring, Md. 20901.

### Conference Examines Pattern Recognition

WASHINGTON, D.C. — The First International Joint Conference on Pattern Recognition is intended to bring together scientists and engineers to report their latest research and developments and to discuss the directions and goals for future work in pattern recognition, according to conference treasurer Lou Rotoilo.

The conference, Oct. 30-Nov. 1 at the Mayflower Hotel here, will feature 65 papers covering character recognition, syntactic methods, adaptive pattern recognition and picture processing.

Mathematical methods, biomedical application and remote sensing will also be covered.

Among the papers to be presented are "Class: Non-Parametric Clustering of Large Data Problems," "Machine Recognition of Handprinted Characters," "Pattern Recognition of X-Ray Images" and "Some Studies on Parallel Processing for Character Recognition."

#### Workshops, Too

In addition to the paper presentations, there will be two workshops — "Bridging the Gap Between Theory and Implementation in Pattern Recognition Research" and "Problems in Pattern Recognition Research."

Registration for the conference is \$55 for sponsor members (ACM, IEEE, Ifips, OSA, PRS, SPIE) and \$65 for non-members and \$10 for students.

Further information is available from Louis S. Rotolo, Pattern Recognition Society, P.O. Box 629, Silver Spring, Md. 20901.

entirely by government-funding mechanisms.

The final debate will focus on "Resolved: That Asis should take a leadership role in developing and establishing standards required by the information science community."

Technical sessions will include discussions of network interconnection; micrographics — their place, use and future; and the National Commission on Libraries and Information Science (NCLIS).

In addition to the sessions, Asis special interest groups will host technical sessions on subjects ranging from the state of the art of reprographic technology to the structure of economic and cost analyses.

On Thursday, the politics of information will be discussed.

Registration for the "Information Benefits & Costs" conference is \$45 for Asis members, \$60 for others. Further information is available from H.W. Jones, Asis '73 Conference Chairman, Northrop Corp., Aircraft Division, Hawthorne, Calif. 90250.

Oct. 12-13, Sacramento, Calif. — Data Processing Legal Seminar and Workshop. Contact: Sacramento Chapter, DPMA, P.O. Box 1223, 95806.

Oct. 23-25, New York — IEEE Seminar, "Effective Engineering Design." Contact: Educational Registrar, IEEE, 345 E. 47th St., 10017.

Oct. 24, Saddle Brook, N.J. — Third Jersey Systems Conference of the ASM. Contact: Dennis J. Jones, Merck & Co., Bldg. 60-42, Rahway, N.J. 07065.

Oct. 24, New York — ASM Seminar, "The Human Side of Systems." Contact: ASM Education Dept., 24587 Bagley Road, Cleveland, Ohio 44138.

Oct. 24-26, Denver — Honeywell Health Care Users Group. Contact: Thomas Alex, St. Joseph's Hospital, 220 York Road, Baltimore, Md. 21204.

Oct. 25-26, Detroit — DPMA Region Nine Fall Conference, "The 70's and Beyond." Contact: Glenn Fritsch, Automobile Club of Michigan, 150 Bagley Road, Mich. 48226.

Oct. 26, New York — Eighth Annual ACM Urban Symposium. Contact: Etelle Grinich, Sperry Gyroscope Co., Great Neck, N.Y. 10020.

Oct. 28-30, Atlanta — Digitronics Users Association 8th Annual Conference. Contact: Glenn Lutat, DUA, P.O. Box 497, Santa Clara, Calif. 95052.

Oct. 31, St. Louis — National Conference on the Use of On-Line Computers in Psychology. Contact: Dr. Donald Tepas, Dept. of Psychology, St. Louis University, St. Louis, Mo. 63103.

Nov. 4-6, Gaithersburg, Md. — ACM Sigplan/Sigir Interface. Contact: Registration Chairman, P.O. Box 212, Silver Spring, Md. 20907.

Nov. 5-7, Atlanta — Cooperative Health-Care Users Group (Chug). Contact: Robert Murrie, Florida Software Services, P.O. Box 2269, Orlando, Fla. 32802.

Nov. 5-7, Boston — IEEE 1973 Conference on Systems, Man & Cybernetics. Contact: Sheldon Baron, Bolt Beranek & Newman, Inc., 50 Moulton St., Cambridge, Mass. 02138.

## Calendar

# SYCOR PRESENTS THE LATE, LATE SHOW.



**S**  
SYCOR INC

Late at night, long after your office people are asleep, your Sycor 340 is hard at work. Alone.

Pollled by the master station via dial-up lines, it automatically transmits the data your people entered the day before.

Next day, the processed data is waiting with your morning coffee.

Our Sycor 340's knack for clean source data entry is what makes it all possible. By making it impossible to enter the wrong data in the first place.

Using our powerful, yet easy to use T.A.L. programming language, you can tailor the 340's 8K bytes of memory to your specific applications.

In fact, you can further enhance the 340's built-in error detection and arithmetic capabilities to include operations like Range Checking, Table Look-Up, Multiply and Conditional Data Entry.

And, thanks to T.A.L., you do it at a fraction of the cost of developing your own software.

As you might imagine, unattended communications is just one of the advantages of our Sycor 340. Advantages only an intelligent terminal can deliver.

To find out more, contact your Sycor representative today.

You might sleep a little easier tonight.



**SYCOR**

**Corporate Offices:** Ann Arbor, Michigan 48104 (313) 971-0900. **District Sales Offices:** Atlanta (404) 457-1166 • Boston (617) 890-7290 • Chicago (312) 986-1833 • Cleveland (216) 831-8625 • Dallas (214) 521-6710 • Detroit (313) 522-0080 • Hartford (203) 529-1100 • Houston (713) 688-5224 • Indianapolis (317) 784-6779 • Los Angeles (213) 640-0120 • New York (212) 371-9050 • Philadelphia (609) 665-1170 • Pittsburgh (412) 922-3350 • San Francisco (415) 349-6626 • St. Louis (314) 878-0090 • Washington (703) 525-7300. **Canada:** Sycor International Ltd., Toronto (416) 429-0883. **Service Centers in 80 cities.**

Sycor has opportunities for experienced data processing equipment salesmen and systems engineers in major cities.

Recurring Computer Nightmare #3



## The day Midwest airlines got their new DC-10.

What can you do . . . fire your programmer? Give your 360 a swift kick in the console? The fact remains, that EDP errors can ground even the largest operation.

What you need is a way to cut your possibility of error down to an absolute minimum. And the easiest place to start is in your selection of computer tape. How? By specifying BASF.

At BASF, we produce tapes that are a lot better than they have to be. It's this extra margin that allows no margin for errors. For example, our special coating technique provides a more even dispersion of oxide particles in the binder, so you get improved bit-to-bit uniformity, and fewer drop-outs.

One more point. Our tapes don't

cost any more than the competition's. You're already paying for BASF quality . . . you might as well have it. Write today for the complete story of how BASF computer tapes stack up against the competition. Remember, nobody makes a better tape than the people who invented it. BASF Systems, Crosby Drive, Bedford, Mass. 01730.



**When it's BASF...you know it's not the tape that goofed.**

# COMPUTER INDUSTRY

## CI Notes

### NCR Buys Adds Terminals

HAUPPAUGE, N.Y. — NCR has agreed to market Applied Digital Data Systems Inc.'s (Adds) CRT terminals.

The three-year contract is valued at over \$10 million. During the first year Adds will receive more than \$2.5 million, according to the firm. Deliveries will start in January.

### Trade Secret Trial Date Set

CW West Coast Bureau

SAN JOSE, Calif. — Pretrial motions in the multimillion dollar industrial espionage case involving alleged theft of trade secrets from IBM have been set for Nov. 26.

The San Jose Superior Court judge said it would take at least a week to hear all motions from the ten defendants, who allegedly conspired to steal secrets relating to three generations of IBM disk drives.

The defendants are expected to ask for discharge of the indictments, change of venue and severance of the cases.

### ITT Picks Data Products Core

WOODLAND HILLS, Calif. — Data Products Corp. has received a multi-million dollar contract for core memory systems from the Bell Telephone Manufacturing Co. of Belgium, an ITT subsidiary.

The memories will be made in Ireland at Data Products Core Memories, Ltd., a subsidiary of Data Products.

### HIS Markets Hospital System

WALTHAM, Mass. — Honeywell has been named worldwide licensee of a computerized hospital management system designed by National Data Communications.

Honeywell will market the system and NDC will provide maintenance and facilities management services.

### Supershorts

Tesdata Systems Corp. is centralizing its engineering and manufacturing operations in a subsidiary, California-Tesdata, Sunnyvale, Calif.

Conrac Corp. has named Elektron, GmbH, as its sales representative in Western and Eastern Europe for its CRT terminals, models 480 and 401-3.

Honeywell has selected Information Systems Iran as distributor for its DP products and services in Iran.

Sorbus Inc. is offering documentation services to DP equipment manufacturers for the preparation of technical manuals, handbooks and trouble-shooting procedures.

### Claims Agencies Buy Without Bids

## CLA Hits Federal Procurement Practices

By Molly Upton

Of the CW Staff

WASHINGTON, D.C. — The Computer Lessors Association (CLA) has taken the General Services Administration to task in a series of letters decrying the practice by federal agencies of transferring rented DP equipment within agencies without reopening bids for the systems.

In addition, the "GSA has and continues to buy previously rented equipment from IBM on a sole-source basis," executive director James F. Benton stated.

Benton reiterated the charge that the use of mandatory memory contracts [CW, Aug. 8] "stifles our industry's ability to offer cost reductions on government-acquired [DP equipment]." He also charged the GSA with issuing "restrictive hardware requirements."

"Many departments and agencies are using the rental accruals and special purchase options to buy an installed item or items of [DP equipment] from the OEM without a competitive solicitation which indicates the intent and spirit of your procurement regulations are just not being adhered to or enforced," the CLA chief said.

In fiscal 1973, Benton said, over \$40 million [worth of equipment] (overwhelmingly IBM) [was] transferred between agencies when no least-cost alternatives were sought.

In a reply letter, Commissioner M.S. Meeker of the GSA's Automated Data and Telecommunications Service defended the mandatory memory contracts and cited the use of competitive bidding for DP equipment by agencies.

He admitted the GSA "is not em-

powered or staffed to audit the activities of agencies to determine whether they comply in each and every instance with existing regulations; however, when such actions are specifically identified and brought to our attention, we take appropriate action to preclude their recurrence."

The GSA, Meeker said, issued "letters to all agencies advising them that they should consider several courses of action which include the availability of equipment from leasing firms. This type of guidance was issued so as to preclude occurrences such as those you allege to have happened."

Since initiation of the "Master Terms and Conditions," jointly developed by the CLA and GSA, Meeker stated, the GSA has acquired "23 systems and awarded contracts valued at about \$4.4 million. These contracts have gone almost exclusively to the third-party industry," he noted.

On the subject of the memory contracts, Meeker said, "It is our obligation to the general public to acquire equipment which meets the government's needs at the lowest overall cost. Our chief concern in this area is that all potential suppliers have an adequate and equal opportunity to compete... We have reviewed the extent of competition received on solicitations where memory was to be obtained from the mandatory requirement contract and solicitations where memory was to be obtained from the general marketplace along with the CPU. Our records show the number of offers received under each type of solicitation is virtually the same."

In a return letter to Meeker, Benton said the CLA believes, "It is incumbent upon GSA to be aware of DP systems which are procured on a sole-source basis and stop the practice. If, as you state in your letter, GSA 'is not empowered or staffed to audit' these activities, then who can we turn to for help?"

### GSA Initiates Quality Control After Trouble With Memories

WASHINGTON, D.C. — The General Services Administration is initiating a quality control program on requirements-type contracts to insure that DP products perform to specifications, according to a GSA spokesman.

Several agencies procuring add-on memories under mandatory contracts encountered difficulties with the equipment.

The GSA is forming interagency committees, comprised of principal technical users, to work with the GSA in qualifying the devices, and is also inserting a quality assurance program in the contractual terms, the spokesman said.

The GSA has always had, but not always used, the right to conduct a performance test prior to award, he said.

Under the new plan, the interagency committee would "observe and accept or reject the preaward performance," he said.

"There were initial performance problems with memories for the 360/65 and other models; however, as far as we are aware, there are no performance problems now," he said.

#### Certain Units Required

Under the mandatory type of contract, government agencies are required to procure memory for new machines from specified firms or replace existing memory if the installed memory costs more than the bids from these firms.

Under the contracts, Cambridge Memories supplies units for 360/30s, Ampex for 40s, 50s, 65s, 370/165s, and Univac 1106s and 1108s, while Memory Technology supplies memory for 370/155s.

The firms' bids ranged from 60% to 80% off the original mainframe prices for equivalent types of memory.

There were problems on the Ampex units for the Univac 1106 and 1108 and the 360/65 and 370/165. There were no problems with Ampex units for the 40 and 50, the spokesman said.

On the 1108, there were "several" problems, some pertaining to parity checking, and a cabling problem, he noted.

There were about three sites that experienced problems on the 65 and 165 memories, and they appeared to vary by site, he said.

Memory Technology experienced "what appeared to be a design problem" on the first 370/155 site. "They got that straightened out and there hasn't been any problem since," he said.

There were no reported problems on the Cambridge Memories 360/30 units.

### Minis Seen Bringing Changes

LOS ANGELES — The accelerated development of minicomputer systems in business is giving rise to new opportunities and new dangers for suppliers, and a new approach to management of computers by users, according to Frank Wagner, executive vice-president of Informatics, Inc.

The chief impact of the use of minicomputers in business for a wide range of tasks will be "to bring computer management back to the people who do the work," he told the Western Systems Conference of the Association for Systems Management.

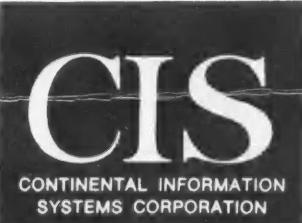
Where minicomputer systems are concerned, Wagner warned, it may be dangerous to follow blindly Grosch's First Law (which can be formulated as "throughput capacity of the computer increases as the square of the price").

He offered "Wagner's First Principle of Decentralized Computing" as a guide for users: "If an organization group smaller than 30 people required computer assistance, it is better for the enterprise that these people have exclusive use of their own computer, provided that the computer, big enough to do the job properly, will be loaded to over 10% capacity."

# New System 370's Attractive Delivery Schedules.

For Sale or Lease. Terms: From 3 Years.  
ITC Available. Contact Ed Tibbits or Dean Harrer.  
at (315) 474-5776

SYRACUSE, N.Y. Midtown Plaza 13210 (315) 474-5776



### Delivery Schedules

370/145 Model I2	
Immediate Delivery	10/5/73
370/158 Model J	
#1 Delivery	11/16/73
#2 Delivery	1/18/74
#3 Delivery	2/15/74
370/158 Model K	
Delivery	10/19/73
370/168 Model K	
#1 Delivery	4/19/74
#2 Delivery	5/17/74
#3 Delivery	5/17/74

## The Computer Caravan welcomes:

**BCS**

BOEING COMPUTER SERVICES, INC.

as an exhibitor in The Spring 1974 Caravan.

Boeing Computer Services, Inc. offers a full line of data processing services. The BCSNET, a unique network for high-quality, low-error data transmission over low, medium and high speed lines, will be demonstrated. Unique channel and line testing methods insure consistency and reliability of data transmission.

**What may we say about your company?**

### The Computer Caravan/74

sponsored by



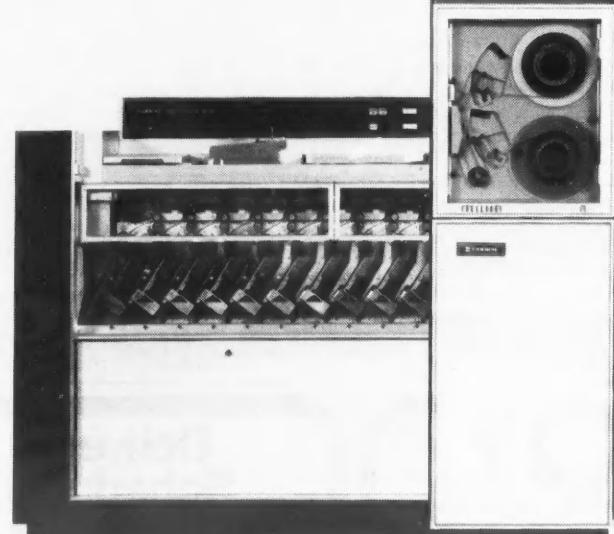
**COMPUTERWORLD**

Washington • Cincinnati • Houston • Anaheim  
San Francisco • St. Louis • Chicago • Boston  
Charlotte • New York  
797 Washington St., Newton, Mass. (617) 332-5606



Look at scanning. Key/disk. Look at performance.  
And costs. Look at multimedia.

When you look at the best...  
you'll see the Cummins KeyScan™  
Data Entry System.



**4400**  
KeyScan Multimedia Data Entry System

Look at scanning. With KeyScan, a single key stroke of each unrecognized character provides re-entry of rejects without rehandling while still scanning the same block of documents. Data from all documents is edited and balanced by batch, in a single pass through the System.

Look at key entry. Cummins key/disk terminals provide more power per dollar than any other key entry system.

Look at both. KeyScan is a shared processor, key/disk scanning system that affords unparalleled flexibility. It's the first multimedia data entry system, the only high performance system and it's moderately priced.

Whether you need an OCR scanning system, a stand-alone key/disk system, or an off-line print station... KeyScan enables you to select what you need at a price you can afford.

And, as your requirements change, you can reconfigure your hardware and software to do the new job... the best way.

All this from a company with systems, programming, and forms design support, and over 45 branch sales and service offices located across the country. So write today for our new 4400 KeyScan System brochure. Write: Cummins, 830 Waukegan Rd., Glenview, IL 60025. Or better yet, call us at 312/724-8000 and make an appointment to visit our demonstration facilities.

And remember, when you think data entry, look at Cummins KeyScan Multimedia Data Entry System. Then look at other systems and you decide which is best.

**CA CUMMINS**  
CUMMINS-ALLISON CORP.

## IBM Agrees With U.N. on Need For Multinational Conduct Code

By Toni Wiseman

Of the CW Staff

NEW YORK — While agreeing with the United Nations Economic and Social Council's recommendation for a "set of institutions and devices" to guide the exercise of power of multinational corporations, IBM cautioned that such institutions "might actually upset the special conditions an industry such as ours needs if it is to continue to play its key role in development."

Jacques C. Maisonrouge, president of IBM World Trade, was referring to institutions and devices advocated in a U.N. report, to "guide the multinational corporations' exercise of power and introduce some form of accountability to the international community in their activities."

Guidelines which would lead to reduced remittances, requirements for the dispersal of manufacturing and R&D capabilities, and the demand for divided

ownership or local control "would cripple the effectiveness of many high technology companies, most certainly including IBM," said Maisonrouge, addressing a group at the U.N.

Maisonrouge advocated the establishment of a code of conduct, or multinational company register. While recognizing the difficulty of drafting a code that would be acceptable to all, he urged the inclusion of five points:

- "The employment of nationals totally or predominantly, in affiliates should be strongly encouraged."
- "There should be multinational representation in headquarters and on boards of directors."
- "Stock ownership should be on a multinational basis."
- "There should be adequate guidelines on transfer pricing."
- "The performance of a company, particularly in a developing country, should be judged to a degree on its performance in the area of social responsibility."

In his address, Maisonrouge pointed out that "virtually all IBM employees abroad are nationals of the countries in which they work. Out of our nearly 117,000 IBM employees outside the U.S., less than 28,000 are employed in manufacturing."

IBM is in "three different but deeply interrelated businesses within the computer industry — we produce software, hardware and provide services. These activities require the allocation of our resources on a worldwide basis," he noted.

"As you know, there is a school of thought that sees the multinational company and the nation-state on a collision course," Maisonrouge said. "We do not believe this is so. The two, in our judgment, will work out the differences between them."

### INTRODUCTORY OFFER:

## MINICOMPUTER REVIEW

A guide for decision makers in all industries who need analytical as well as technical information about minicomputers and the companies that manufacture them.

Over 120 minis reviewed individually:  
CONCISE DESCRIPTION with price and date of introduction.

FEATURES of general interest such as Time-Sharing, Process Control, Upward Compatibility, Conversational Languages and more.

HARDWARE CHARACTERISTICS indicating instruction sets, CPU characteristics, speed, capacity, word size and communications capabilities.

RANGE OF PERIPHERALS available for each mini and their storage or throughput capacity.

SOFTWARE languages and operating systems and memory requirements for each.

COMPANY PROFILES include address, financial data, number of minis sold, and hardware and software of each manufacturer worldwide.

Clear format and uniform layout make the MINICOMPUTER REVIEW easy to use. Well organized categories show the pros and cons of every mini.

About 200 pages, loose leaf bound in a handy pocket size notebook. New equipment updates are issued every 4 months.

A one year subscription is \$38.00.  
Special introductory offer: \$28.50.

GML Corporation  
594 Marrett Road, Lexington, MA 02173  
617 861-0515

### SIMPLY CLIP AND MAIL

Please send me MINICOMPUTER REVIEW at \$28.50/yr.

Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

# INTERDATA ANNOUNCES THE INDUSTRY'S FIRST 32-BIT MINICOMPUTER FOR UNDER \$10,000.

## WITH UP TO A MILLION BYTES OF DIRECTLY ADDRESSABLE MEMORY.



Minicomputer myths you can live without:

1. There's no such thing as a 32-bit minicomputer.
2. Minicomputers have an absolute 64K addressing limit.
3. The only way to even access more is to resort to some sort of hardware kluge with a hairy software scheme that'll cost you an arm and a leg.

All wrong.

Because now there's the Interdata 7/32 — a powerful new 32-bit minicomputer with main memory expandable up to a million bytes and direct addressing up to 16 million bytes.

Performance	7/32	Nova 840	PDP-11/40
Word length	32	16	16
Memory speed (nanoseconds)	750	800	900
Maximum memory capacity (bytes)	1,048,576	262,144	262,144
Addressing range (bytes)			
Direct	1,048,576	512	65,536
Relative	±16,384	±256	±32,768
Indexed	1,048,576	65,536	65,536
Double indexed	1,048,576	No	No
General-purpose registers	32 32-bit	4 16-bit	8 16-bit
Index registers	30 32-bit	2 16-bit	8 16-bit
Vector interrupt levels	Yes	No	Yes
Minimum interrupt overhead time (usec)	6.5	47.5	46.5

Price	7/32	Nova 840	PDP-11/40
32 KB processor	\$ 9,950	\$12,930	\$15,345
64 KB processor	14,450	19,330	26,925
128 KB processor	23,450	35,630	44,725
256 KB processor	41,450	61,230	80,825
1 Megabyte processor	171,650	Not available	Not available

Source: Data General Price List, 5/15/73. DEC PDP-11/40 Price List, 6/73. DEC OEM & Product Services Catalog, 1972. Auerbach Minicomputer Characteristic Digest, June, 1973. "How to use Nova Computers", 1973.

Big it is. But hairy it isn't.

Because it's simple, straightforward and efficient. And it's the industry's first uncomplicated extended-memory software environment.

Backed up by a lot of hardware muscle like thirty two, 32-bit registers. 1024 I/O interrupts with automatic vectoring. 239 instructions. And a lot more. All of which would lead you to expect to pay a lot more money, right? Well, that's also a myth.

The software muscle is all there, too. A new FORTRAN V compiler. An optimizing assembler called CAL. And the first extended operating system that's both powerful and simple — OS/32. Plus all the other field-proven Interdata software — it's all compatible.

The new Interdata 7/32.

We put our muscle where their myth is.

**INTERDATA®**

2 Crescent Place, Oceanport, New Jersey 07757 (201) 229-4040.  
Boston — (617) 890-0557. Washington — (703) 525-4806. Philadelphia — (215) 436-5579.  
Orlando — (305) 851-6962. Chicago — (312) 437-5120. Detroit — (313) 356-5515.  
Dayton — (513) 434-4193. Kansas City — (913) 384-1606. Houston — (713) 783-3060.  
Dallas — (214) 238-9656. Denver — (303) 759-0474. Los Angeles — (213) 640-0451.  
Phoenix — (602) 968-2477. San Diego — (714) 565-0602. San Francisco — (415) 969-1180.  
Seattle — (206) 455-0680. Toronto — (416) 677-8990. Tokyo — (270) 7711.  
Sydney — 439-8400. London — Uxbridge 52441. Munich — 0811-8543887.



## When You Say "Caelus" You're Saying "Satisfaction"

- Satisfaction with the promptness with which we fill your orders.
- Satisfaction with the way our packs perform—and keep on performing.
- Satisfaction with the service we give you—whenever you need it.

### Caelus Quality = Satisfaction



A Division of Electronic Memories & Magnetics Corporation  
12621 Chadron Ave., Hawthorne, Calif. 90250

Order your Caelus disk packs directly from your local customer service office.

**Albuquerque:** (505) 265-2127. **Boston:** (617) 861-9650. **Chicago:** (312) 297-3110. **Cleveland:** (216) 884-1980. **Dallas:** (214) 243-2374. **Detroit:** (313) 352-1040. **Honolulu:** (808) 845-6417. **Houston:** (713) 626-3592. **Los Angeles:** (213) 477-3911. **Milwaukee:** (414) 251-4214. **Miami:** (305) 634-7695. **New York:** (201) 845-0450. **Philadelphia:** (215) 887-4940. **Pittsburgh:** (412) 921-1221. **San Francisco:** (415) 692-4250. **Seattle:** (206) 623-1477. **St. Louis:** (314) 863-0015. **Washington:** (703) 941-2100



We all know the problems with using cards... deck dropping, misfiling, card loss, reproduction, sorting, jamming, warping, storage and on and on.

**PANVALET** eliminates cards and the problems associated with them! **PANVALET**, The Program Management and Security System is the ultimate answer in properly storing, maintaining, retrieving, controlling and protecting programs.

Want to know more? We'll be glad to tell you!

Call or Write:

**Panosphic Systems, Incorporated**

1211 W. 22nd Street • Oak Brook, Illinois 60521 • (312) 325-9600

## Software Bill Has Industry OK

By Toni Wiseman

Of the CW Staff

NEWTON, Mass.—Industry reaction was unanimously favorable to the recently passed California software taxation bill, according to a *Computerworld* survey.

The bill, AB69, recently signed by Governor Ronald Reagan, exempts from taxation all software except that classified as "basic operational."

The software which remains taxable under the present bill includes the common fundamental control programs whose price is generally included in the vendor's hardware price.

"The basic operating system is always claimed by the vendor to be a piece of the hardware, so to speak, so it's probably fair to tax that," said Dick Jones, president of Programmatic Inc. "But certainly the applications that the user builds are not really things that can be assessed properly by the tax people, since different users use different ways for accruing their costs and placing a value on these programs."

"I'm pleased as punch," said Bill New-

comber, vice-president of Dylakor Corp., about the law. "I think it will be a tremendous benefit to the software industry in California.

"What they were proposing was an extremely dangerous thing," he said, "because it was like taxing something which doesn't really exist, like an idea."

"If they'd been allowed to do that, they would be able to go in and tax lawyers' briefs and contracts and everything else."

"I think the only reason they're taxing basic operating systems is that this way they can tax the entire price when a customer buys an IBM computer," said Marty Goetz, vice-president of Applied Data Research. "I don't think it's going to effect any independent software company's policies."

Dave Ferguson, president of System/3, did not agree with this view. "I think that vendors may tend to write their programs differently," he said, "essentially to put less in or to circumvent the law by either making the operating software negligible or making it so big that it performs so many additional functions that it can't be construed as being operating system type functions. From the legal point of view the operating software itself might not exist."

Apart from benefiting software users in California, the amended bill is expected to aid in the passage of similar laws being considered in other states.

The only question which seems to arise is the definition of "basic operational software" as set forth in the bill.

"Software is a delicate, difficult subject, you can't really nail it down in an assembly bill," Ferguson said.

"The definition is still a little bit of a problem, it's sort of subject to interpretation," Newcomer agreed, "but I think there was enough wordage in this one so they're going to have a harder time trying to tax everything."

### Orange County Awards CSC \$26 Million Contract

CW West Coast Bureau

SANTA ANA, Calif.—Orange County has finalized its \$26 million facilities management agreement with Computer Sciences Corp. (CSC).

The contract was signed by Ronald Caspers, chairman of the board of supervisors, and Erwin L. Allen, president of CSC's commercial division. The signing took place after receipt of a \$1 million letter of credit from the Bank of America in lieu of a performance bond.

The county will also withhold 10% of each invoice until it builds a \$1 million account as a performance guarantee.



### You may not need U.P.S. Monitor and evaluate. Then decide.

- Monitors single or three phase power
  - Transient response 0.5–100 μs
  - Transient amplitudes ± 50 to ± 600 volts
  - 50 or 60 Hz, switch-selectable
  - Event registers:  
undervoltage and overvoltage  
under/overfrequency  
low-magnitude transients  
high-magnitude transients
  - Audio and visual alarms
  - Time and event recorder
  - Quartz crystal clock
  - Solid state circuitry
  - Portable and lightweight
  - Easy to operate: no attendant necessary
  - Virtually maintenance-free
- New FSN 6625-275-2668

Programmed Power Inc.

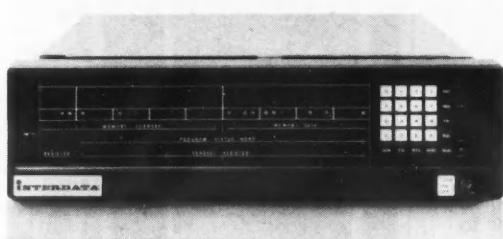
Subsidiary of Franklin Electric

141 Jefferson Drive  
Menlo Park, CA 94025  
(415) 323-8454



# INTERDATA ANNOUNCES THE INDUSTRY'S FIRST \$3200 MINICOMPUTER TO CHALLENGE THE NOVA.

## PDP-11 PERFORMANCE AT A NOVA 2 PRICE.



Minicomputer myths you can live without:

1. There is no such thing as a high-performance, low-cost minicomputer.
2. You have to choose between two extremes — pay a ton for a machine like the PDP-11 and save on software costs, or buy a cheapie like the Nova 2 and pay the price later.

All wrong.

Because now there's the Interdata 7/16 — an extremely flexible 16-bit OEM minicomputer that combines the best of both worlds.

It's easier to program than the PDP-11 because it has 16 hardware registers, up to 64K bytes of directly addressable main memory, 255 I/O interrupts with automatic vectoring to service routines and a comprehensive set of more than 100 instructions. That's a lot of muscle.

It's completely modular in design — plug-in options can be installed in the field to meet your specific application requirements.

Performance	7/16	Nova 2/4	PDP-11/05
Data word length (bits)	4, 8, 16	16	1, 8, 16
Instruction word length (bits)	16, 32	16	16, 32, 48
General-purpose registers	16	4	8
Hardware index registers	15	2	8
Maximum memory available (K-bytes)	64	64	64
Directly addressable memory (K-bytes)	64	2	64
Automatic interrupt vectoring	Standard	Not available	Standard
Parity	Optional	Not available	Special order
Cycle time (usec.)	1.0 or 0.75	1.0 or 0.8	0.9
Available I/O slots	4	2	2

Price	7/16	Nova 2/4	PDP-11/05
8 KB processor	\$3,200	\$3,200	\$4,795
16 KB processor	3,700	3,700	6,495
32 KB processor	5,300	5,300	10,895
Multiply/Divide option	\$950	\$1,600	\$1,800
Floating Point option	\$4,900	\$4,000 plus \$1,000 for 2/10 configuration	Not available

Source: Data General Price List, Copyright 1973, and addendum dated 5/15/73. Nova 2/4 bulletin 012-000060, 1973. DEC OEM & Product Services Catalog, 1972. Auerbach Minicomputer Characteristic Digest, June, 1973. "How to use Nova Computers", 1973.

Options like multiply/divide, programmers' console with hexadecimal display, power fail/auto restart, memory protect and a high-speed Arithmetic Logic Unit that includes floating point hardware. In fact, you can expand the low-cost 7/16 all the way up to the 32-bit Interdata 7/32.

Yet it costs as little as \$3200. Just like the machines that give you the bare minimum. And quantity discounts can reduce that low price by as much as 40%.

So you no longer have to make the painful choice between good performance and good price. Or between hardware economy and software efficiency. Now you have a minicomputer that gives you both.

The Interdata 7/16.

We put our muscle where their myth is.

**INTERDATA®**

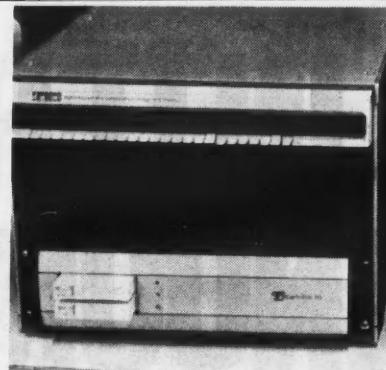
2 Crescent Place, Oceanport, New Jersey 07757 (201) 229-4040.  
Boston — (617) 890-0557. Washington — (703) 525-4806. Philadelphia — (215) 436-5579.  
Orlando — (305) 851-6962. Chicago — (312) 437-5120. Detroit — (313) 356-5515.  
Dayton — (513) 434-4193. Kansas City — (913) 384-1606. Houston — (713) 783-3060.  
Dallas — (214) 238-9656. Denver — (303) 758-0474. Los Angeles — (213) 640-0451.  
Phoenix — (602) 968-2477. San Diego — (714) 565-0602. San Francisco — (415) 969-1180.  
Seattle — (206) 455-0680. Toronto — (416) 677-8990. Tokyo — (270) 7711.  
Sydney — 439-8400. London — Uxbridge 52441. Munich — 0811-8543887.

**Hidden in Cabinets...**

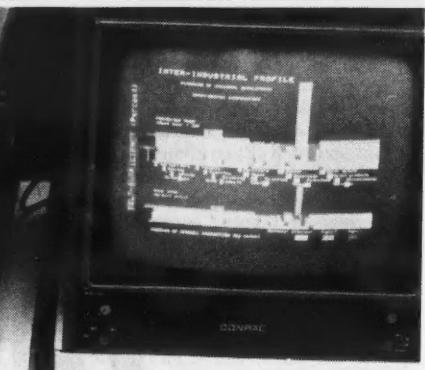
HP 2115A, with Diablo disk, drives CPS, Inc. color graphics system.



Data General Nova 1210 works with Hughes Aircraft Co. graphics system.



DEC PDP 11/05 reformat information on Ramtek Corp. CRT.



CW Photos by Mary Upton

**...Minis Play Supporting Role at Show**

By Molly Upton  
Of the CW Staff

**SAN FRANCISCO** — Minis, once the star of trade shows, have lately found an important, though less conspicuous, role in supporting other devices. At a recent trade show here, Wescon, the minis were

in abundance, but primarily as components.

Hidden in cabinets, sitting on the floor or somewhere within a unit, minis were at work driving display units and testing devices.

CPS, Inc. of Sunnyvale, Calif., used a

Hewlett-Packard 2115A to drive its four-color graphics system.

Ramtek Corp., also of Sunnyvale, chose a Digital Equipment PDP 11/05, linked with a Cartridge 20 tape unit to reformat information shown on its Conrac tube.

Hughes Aircraft Co., Industrial Products Division, hid a Data General Nova 1210 in a cabinet and used it as a data source to drive the Conographic display terminal system.

Data Disc, Inc. used an Interdata 70 with a Bright tape drive in its Anagraph display system.

A DEC PDP-8/e drove a Gould Inc. Brush 6000 video and data logger monitor. The unit can handle up to 128 channels and displays numerical data on a CRT.

In the Xynetics booth, an HP 2100A with a 7970B tape drive drove a Xynetics C62 controller for its 1050 plotter.

Although not known specifically for its minis, Teradyne had its own 16K mini as part of its N151 automatic backplane test system.

Tektronix used DEC PDP 11/05s to drive its 7704A oscilloscope and its digitizer.

Although the Hewlett-Packard Data Systems Division did not exhibit, an HP 2100S was at work in the firm's automatic digital circuit test system.

DEC had a PDP 16/m linked to its RTO2 alphanumeric data entry terminal.



DEC PDP-8/e, perched on the floor, drives Gould Brush 6000 data logger.

**Operator and Machine**  
**...complete the**  
**vital connection**  
**with ASI**  
**training and education.**



The day of the operator as only a button pusher or tape hanger is gone. Today's operator not only needs to know which button to push and when, he needs to know the "System".

That's why Advanced Systems Incorporated has developed a total operator curriculum. Our operator career path plan for trainees, operators with six months to a year experience, senior console operators, shift supervisors and operations managers, includes such courses as: Computer Operator Training 360 and 370, V S Systems Operator Training, HASP, J C L and many others. We also have the education and training for your environment—D O S / V S, OS, OS/MFT, OS/MVT, V S and more.

Developing today's Man for tomorrow's challenge

**ADVANCED SYSTEMS**

INCORPORATED

Corporate Office, 1601 Tonne Road  
Elk Grove Village, Illinois 60007  
Phone 312/593-1790

Offices in Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis and Washington, D.C.

International affiliates in South Africa, Australia, Canada, England, West Germany, Iran, Mexico and Sweden.

ADVANCED SYSTEMS INCORPORATED

Dept. 15  
1601 Tonne Road/Elk Grove Village/Illinois 60007

Please send me more information on your Operator's Curriculum.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_ PHONE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PRODUCT AND MARKET PLANNING

EDP BUSINESS STRATEGY

**AUERBACH**  
ASSOCIATES, INC.

PHILADELPHIA • NEW YORK  
WASHINGTON • LONDON  
(215) 491-8200

# This coupon is to tempt you.

Please send me COMPUTERWORLD for 1 year and bill me later.

U.S. - \$9       Canada - \$10       Other foreign - \$25

First Initial	Middle Initial	Surname
Your Title	T - 340	
Company Name	Send to:	Address
City	State	Zip Code

Address shown is:  
 Business  
 Home



COMPUTERWORLD

Check here if you do not  
wish to receive promotional  
mail from Computerworld.

PLEASE CIRCLE 1 NUMBER IN EACH  
CATEGORY

YOUR INDUSTRY

- 01 Mining/Construction/ Oil & Refining
- 02 Manufacturing - Computer or data system hardware peripherals/other associated mechanical devices
- 03 Manufacturing (other)
- 04 Utilities/Comm. Sys./Transportation
- 05 Wholesale/Retail
- 06 Finance/Insurance/Real Estate
- 07 DP Serv. Bureau/Software/Planning
- 08 Business Services (except DR)
- 09 Education/Medical/Legal
- 10 Federal, State and Local Government
- 12 Communications/Printing/Publishing
- 13 Other: \_\_\_\_\_

YOUR FUNCTION

- 01 Corporate Officer
- 02 Data Processing & Operational Management
- 03 Data Processing Professional Staff
- 04 Consultant
- 05 Lawyer/Accountant
- 06 Engineering-Management/Scientific/R&D
- 07 Sales/Marketing/Account Executive
- 08 Librarian/Educator/Student
- 09 Other: \_\_\_\_\_

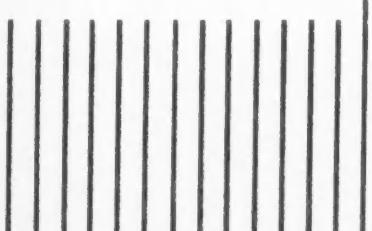
FIRST CLASS  
PERMIT NO. 40760  
NEWTON, MASS.

BUSINESS REPLY MAIL No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY



797 Washington Street  
Newton, Massachusetts 02160



**We not only insure your computers,  
we insure everything  
they know.**

# The St Paul

There's only one thing more valuable than your computers. And that's the data they hold.

So if fire, smoke or vandalism can destroy both, doesn't it make sense that your insurance cover both?

We think so. Which is why our Electronic Data Processing Policy includes replacing every bit of lost media — even if it means working overtime or at another location.

In addition to insuring your equipment and media, The St. Paul covers loss of earnings, extra expenses of staying in business, even coverage

for valuable papers and accounts receivable.

As the first insurance company to offer the EDP Policy over a decade ago, The St. Paul has the expertise to bring you a coverage which will quickly and firmly get you back on your feet.

EDP. It's the kind of innovative insurance that's made us a leader for over a century.

The St. Paul is a major subsidiary of The St. Paul Companies, ranked by Fortune Magazine among the top fifty largest diversified financial companies.

Call your St. Paul  
Agent. He's listed in the  
Yellow Pages.



St. Paul, Minnesota 55102

**St. Paul Fire and Marine Insurance Company, St. Paul Mercury Insurance Company, The St. Paul Insurance Company.**

FIRST CLASS

# Quantum/L: So reliable it shattered the time limit on tape guarantees.

Until this year, computer tape guarantees had always been limited to a set number of years.

Then came Quantum/L, with the industry's first life-time guarantee: A warranty that the tape would remain free of defects in material and workmanship as long as it's used by the original purchaser.

That's a tough promise to live up to.

But Quantum/L is a tough, tough tape. It has a unique cross-linked formulation that makes it unusually durable. Unlike other tapes it doesn't produce oxide shed, even after thousands of passes in the laboratory under stringent environmental conditions.

Quantum/L has also been repeatedly subjected to accelerated aging tests under a wide range of temperatures and humidity conditions. Yet none of the tapes showed any sign of error growth, indicating a remarkable resistance to archival decomposition.

Most important, though, Quantum/L has been tested in thousands of customer locations.

That's how we know. Quantum/L not only lasts longer, it performs better. It starts clean, and it stays clean. Under normal working conditions it will last a lifetime. (And it's tested for 6250 BPI, when you're ready for that.)

When we say Quantum/L is reliable, we back it up with the industry's toughest warranty:

It's the tape that's been shattering reliability standards all over the country.

Memorex Corporation M/S 0064  
1125 Memorex Drive  
Santa Clara, CA 95052

## MEMOREX

10000  
8000  
6000  
4000  
2000  
1000  
MEMOREX QUANTUM/L  
THERMAL SHOCK TEST CERTIFIED



## Allen-Babcock Suit Cites Tymshare 'Stratagems'

By Marvin Smalheiser  
CW West Coast Bureau

**LOS ANGELES** — Intrigue and subterfuge are alleged by Allen-Babcock Computing Co. in its \$45 million breach of contract suit against Tymshare, Inc. following the termination by Tymshare of their merger agreement.

Tymshare described the Superior Court suit as without merit and said it will vigorously oppose the action.

The complaint described a situation in which Allen-Babcock was caught in a severe financial pinch with most of its customer data files and software on a Tymshare computer.

### Real Intent Questioned

Allen-Babcock charged in the suit that the situation was intentionally created and a merger was not the real intent of Tymshare.

The complaint alleged Tymshare conspired "for the express purpose of acquiring the business, trade secrets, customers and key technical personnel" without paying.

The main thrust, the complaint said, was "to delude plaintiff into the belief that Tymshare intended consummating a merger with plaintiff, so that plaintiff would not seek alternate mergers into or acquisitions by other companies while Tymshare progressively took control over plaintiff's affairs..."

Allen-Babcock, in its complaint, charged a series of "stratagems" were used:

- "As the price exacted for the interim financial assistance which Tymshare was providing, Tymshare took over the management and control of plaintiff's financial affairs, thereby obtaining a stranglehold on plaintiff..."

- Tymshare "instructed and directed" Allen-Babcock to transfer its software and customer data files at its Palo Alto main data center to its new 370/158.

Tymshare, the complaint alleged, "ordered and directed" that the telephone lines at Allen-Babcock's data center in Union, N.J., be transferred to Tymshare's data center in Union, N.J., facilitating the takeover of customers when the merger collapsed.

Tymshare's time-sharing computer network was connected to Allen-Babcock's New York office, "further enabling and facilitating Tymshare's takeover of plaintiff's customers when defendants consummated the conspiracy by collapsing the merger," according to the complaint.

Allen-Babcock's key technical personnel were directed to install and start up Tymshare's 370/158, to "create an atmosphere in which plaintiff's key employees would naturally gravitate to and seek employment by Tymshare" when the merger collapsed.

Certain Allen-Babcock customers were solicited by Tymshare, the complaint said, so as "to erode plaintiff's revenues..."

## Retailers Urged to View POS as Complete System

By Marvin Smalheiser  
CW West Coast Bureau

**LOS ANGELES** — The point-of-sale (POS) revolution is not in the future but now; and retailers should see their POS system "as a complete data processing and communications system, not just as an interconnected set of cash register drawers."

That was the message of Moses Shapiro, chairman of the board of General Instrument Corp., in the keynote address at the 15th annual Retail Electronic Data Processing Conference of the National Retail Merchants Association.

"What the POS revolution is really all about is the employment of advanced information-handling technology to communicate more effectively with the transactions occurring on the selling floor: "To distill out of the chaos of the thousands upon thousands of transactions those particular messages you need to hear and understand right now."

Reliability is crucial and all potential system malfunctions must be anticipated in the light of their potential impact on the business of retailing, Shapiro said.

"Data can be recaptured; a lot sale, or in some cases a dissatisfied customer, cannot," he warned.

It is "of critical importance" to select a system that affords a

high degree of flexibility.

J. Mumford Miller, national manager of data processing for Sears Roebuck and Co., said the future of retail operations is through POS, but "at this stage of technology, I am not convinced that effective inventory control requires the timeliness and justifies the cost of on-line computing." Miller spoke at the opening day luncheon.

However, he said, "It may be feasible with in-store POS equipment to price some lines of merchandise in an on-line manner."

### User Involvement Needed for POS

**LOS ANGELES** — A point-of-sale system will give a retailer an important competitive edge, but only if it is effectively planned with the involvement of the people who will make it work.

Four specialists in POS and EDP emphasized this in a panel here last week at the National Retail Merchants Association conference.

Roy Burns, director of total systems development at Dayton's, Minneapolis, suggested the use of an effective task force led by a project leader to implement POS.

"Stay as loose as possible and think and plan modularly," he said.

## Position Announcements

### PROGRAMMERS

ANS-COBOL-DOS  
FULL TIME-TEMPORARY

### CONTRACT OPPORTUNITIES

### COMMERCIAL APPLICATIONS

MODERN OFFICES

### FOREST PRODUCTS CO.

\$8 - \$10/HOUR

### BASED ON EXPERIENCE

SEND RESUMES IN CONFIDENCE

W.E. LLOYD

75 PROSPECT STREET

STAMFORD, CT. 06901

EQUAL OPPORTUNITY

EMPLOYER

### SYSTEMS ANALYST & PROGRAMMER

Positions are available with the City of New Haven, one of the Country's most progressive Municipal Data Processing Centers. Positions are available with:

City Controller's Data Center

New Haven Police Department

New Haven Redevelopment Agency

COBOL and Teleprocessing experience desired. Please send resume outlining background and experience to:

Francis J. Kelly, Controller

The City of New Haven

200 Orange Street

New Haven, Connecticut 06510

### SENIOR ANALYSTS

### AND

### ANALYSTS/PROGRAMMERS

Does the opportunity to design and implement integrated Administrative systems on a wide variety of large scale computers appeal to you? Do you have strong communication skills, both oral and written? Do you have substantial user contact experience?

We seek implementation oriented senior systems analysts and analyst/programmers with a record of accomplishment on third-generation hardware utilizing COBOL.

SCT is a privately held, extremely well financed, profitable systems consulting organization. Since 1968, SCT has perfected the techniques of designing and implementing "non-package" system solutions in the nondefense public systems areas.

A full employee benefit program, including top salaries, stock options

and the advantages of a suburban work location are available for qualified individuals. Send resume or contact:

John O'Brien  
Systems & Computer  
Technology Corporation (SCT)  
7 North Five Point Road  
West Chester, Pennsylvania 19380  
(215) 692-7990

### POSITION ANNOUNCEMENTS

#### COMMUNICATIONS TECHNICIAN:

Nation's largest motor freight company is replacing its nationwide data communications network using state-of-the-art technology. An opening exists for an experienced (3 years) communications technician who can oversee the installation and checkout of this network. Send resume to:

M.S. Cavalli  
Manager, Systems  
Consolidated Freightways  
P.O. Box 3301  
Portland, Oregon 97208

#### COMPUTER SYSTEMS AUDITOR

Phoenix, Arizona

This is internal auditing work involving computer systems. Requires degree in accounting or quantitative analysis plus 3 years responsible experience in accounting and data processing work. Salary \$12,189 - \$15,309 with liberal fringe benefits. Send resume to:

City of Phoenix  
Personnel Department  
251 W. Washington, Room 500  
Phoenix, Arizona 85003

#### ROBERT HALF PERSONNEL AGENCIES

of Los Angeles or Orange County

Partial listing of local positions:  
Programmer (DOS) To \$14,500  
Analyst (OS/1100) To \$18,600  
Prog. Analyst (DOS) To \$16,000  
Systems Manager To \$16,000  
Sr. Sys. Analyst  
(San Diego) To \$20,000  
Dir. Computer. Ops. To \$22,000  
Min. Comp. Analy. To \$22,000  
Also many positions in desirable locations throughout the U.S.  
Client company pays all fees  
Phone or write Duncan White  
(213) 386-6805

Orange: Suite 708  
500 S. Main Orange, 92668  
Los Angeles Suite 2032  
3600 Wilshire Blvd. L.A. 90010

## SUPERVISOR (DATA SYSTEMS)

The U.S. Postal Service is developing a data systems network to be installed in highly mechanized operating plants located in 21 cities throughout the U.S.

To support these systems, we are seeking data system supervisors with proven ability in planning, coordinating and directing the day-to-day operation of real time minicomputer control systems, and off line data processing installations.

The successful candidates will have approximately 3 years in charge experience in an industrial environment with responsibility for real time and/or business A.D.P. applications.

Submit detailed resume, salary history, and preferred geographic location to:

Executive Recruiter  
Code 374-03, Room 9722  
U.S. Postal Service  
Washington, DC 20260

#### WE NOW SEEK

**MARKETING MANAGER** — Data Communications products. \$40,000  
**BRANCH SALES MANAGERS** — Computers and peripherals. Boston, NY, Chicago, Dallas, LA, San Francisco, other major cities.

\$22,000

**SALES REPRESENTATIVES** — Data Input, POS, peripherals. Boston, NY, Chicago, Cleveland, Others.

\$18,000

**DESIGN ENGINEERS** — Computer A/D and D/A subsystems. \$18,000

**FIELD SERVICE REPRESENTATIVES** — Peripherals and CPU experience. New York, Chicago, Boston, Dallas, K.C., L.A., many others.

\$14,000

Call or write now to discuss these and other positions.

**BRUMI ASSOCIATES, INC.**  
366 Broadway  
Jericho, NY 11753  
(516) 822-7940

## PROGRAMMER /ANALYST

Our aggressive and diversified company has a challenging opening for a Programmer/Analyst. Applicants should have strong disc and COBOL background and experience with Honeywell 2000 equipment is preferable.

The position is available in Cody, Wyoming, located just east of Yellowstone National Park. A small western community where family and outdoor recreation can be fully enjoyed.

Please send resume and salary history to:

Manager of Computer Systems  
**HUSKY OIL COMPANY**  
P.O. Box 380  
Cody, Wyoming 82414

An Equal Opportunity Employer

## Payroll Specialist

Are you a systems analyst and do you know your way around the Payroll Department of a large multi-division company? Good! Are you familiar with the PHI Payroll System? Even better!

We are looking for an experienced computer professional to work with one of the industries most successful application packages. We desire someone who will be able to work independently, consulting on the needs of our users and prospects. We also want this person to contribute advanced technical ideas to further the development of our package into other payroll-related functions. Salary commensurate with experience. Occasional travel will be required.

Please forward your resume to our Personnel Department.

**WANG COMPUTER SERVICES**  
(formerly PHI Computer Services)

836 North St., Tewksbury, Mass. 01876  
an equal opportunity and affirmative action employer

LABORATORIES, INC.

POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS
<p><b>Software Group Supervisor</b> IBM 370/155 OS/MVT/HASP</p> <p>The University of Akron Computer Center has a position open for a Supervisor of the Software Group. Our environment is large-scale OS/MVT with T/P. We are seeking an individual who has 5 years experience in computing and a minimum of three years with maintenance and support of multiprocessor operating systems with a good working knowledge and direct experience with HASP and OS, RS or BA degree required, Master's Degree preferred. Will be involved with software and hardware planning effort and developing operating procedures for entire Computer Center as well as responsible for software maintenance. Supervisory experience or demonstrated supervisory potential required. This is an excellent growth position. This position carries general faculty status and a very liberal fringe benefit program. Send resume or call:</p> <p>Mr. Robert L. Briechie Manager of Academic Systems and Programming The University of Akron Computer Center Akron, Ohio 44325 (216) 375-7172</p>	<p><b>SYSTEMS SOFTWARE MANAGER</b></p> <p>Hope College is seeking a systems analyst to maintain XDS operating system and provide instruction and consultation to faculty and students in its use. Applicant must have education and/or experience in systems maintenance. Training in XDS software will be provided if necessary. Salary commensurate with experience and ability. Send resume and salary required to:</p> <p>Dr. D. Marker Hope College Holland, Michigan 49423</p>	<p><b>SCAN OPTICS, INC.</b> <b>MARKETING ORIENTED SYSTEMS ANALYSTS/PROGRAMMERS</b></p> <p>SCAN OPTICS has immediate openings for Marketing-Oriented systems analysts/programmers in the following areas: New York, Minnesota, Illinois, Virginia, Georgia and Ohio. Future requirements may include additional areas of the United States.</p> <p>Your responsibilities will include providing technical expertise within a sales and systems environment, devising creative solutions to data input problems, and assisting our customers in the areas of OCR forms design, system design, and programming implementation.</p> <p>We can offer you an unlimited opportunity for professional growth and many more advantages.</p> <p>Send your resume in confidence to Ms. Linda Susca.</p> <p>22 Prestige Park Road East Hartford, Connecticut 06108 (203) 289-6001</p>		
<p><b>COMPUTER MEASUREMENT SOFTWARE ENGINEERS</b></p> <p>Boole &amp; Babbage is the Industry Leader in software computer measurement and evaluation. We have three outstanding career opportunities for senior professionals to enhance the state of the applied computer measurement and evaluation art.</p> <p><b>ANALYTIC COMPUTER SYSTEM MODELING SPECIALIST</b></p> <p>Responsibilities will include the development and application of analytic models to predict the effect of hardware and software changes on the performance of the IBM 370 VS2R2 system. Successful candidates will have a PhD or MS in Computer Science or related discipline with prior research experience and a thorough familiarity with current research, particularly in virtual memory systems. Knowledge of probabilistic modeling including queueing theory and stochastic processes required.</p> <p><b>SYSTEMS PROGRAMMER</b></p> <p>Responsible for the development of software computer and programming system monitors for the IBM VS operating systems. Candidates must have at least 3 years experience developing or modifying the OS or VS operating systems. Detailed knowledge of MVT or VS2 supervisor and IOS internals required.</p> <p><b>SCIENTIFIC PROGRAMMER</b></p> <p>Responsible for the design and implementation of programs analyzing the performance of IBM VS operating systems. 3-5 years programming experience in scientific or operations theory, matrix algebra, and list processing necessary. BS in math or computer science preferred.</p> <p>All positions require highly motivated, self-reliant and productive individuals who function well on small professional teams. Superior salary and fringe benefits. Please send your resume including salary history to:</p> <p>Mr. Thomas M. Hoger, Manager, Software Engineering Boole &amp; Babbage, Inc. 850 Stewart Drive, Sunnyvale, Calif. 94086</p>	<p><b>Programmers</b></p> <p><b>TRY a CREATIVE SHOP and a TAX CUT</b></p> <p>We are an established systems development company with strong financial backing and pre-eminence in our field. We provide excellent working conditions, meaning a stimulating variety of client systems to build and a receptivity to your creative ideas. We're utilizing OS/MVT, COBOL, PL/I, BAL and developing systems under IMS-II and TOTAL for our clients now. As a further advantage, we offer traffic-free commuting to our offices not far from N.Y.C., and relief from city sales and income taxes. In the next six months, we will move to northern New Jersey which could mean further tax cut for you. And the pay is good.</p> <p>These high-level jobs are available:</p> <p><b>IMS Programmers and Systems Designers</b> - requires a minimum of two years' IMS-II implementation experience under OS, utilizing PL/I and COBOL.</p> <p><b>TP Applications Programmers</b> requires a minimum of two years' teleprocessing experience with OS, COBOL, PL/I.</p> <p>BA/BS degree desired. Interview and relocation costs paid if you live far from us. Please send detailed resume, including salary history and requirements, in confidence to:</p> <p>CW Box 3945 797 Washington Street Newton, Mass. 02160</p> <p>Our employees know of this ad. An equal opportunity employer</p>	<p><b>Challenging New Position in Fast-Growing Computer Services Company</b></p> <p><b>PRODUCTION CONTROL MANAGER</b> for multiple, large-scale computing systems.</p> <p><b>RESPONSIBILITIES</b></p> <ul style="list-style-type: none"> <li>• Direct supervision of production control functions and personnel.</li> <li>• Development and implementation of production control plans and procedures, including performance standards for personnel.</li> </ul> <p><b>QUALIFICATIONS</b></p> <ul style="list-style-type: none"> <li>• Minimum 5 years supervisory experience in computer production control.</li> <li>• Effective skills in planning, developing and implementing operating procedures.</li> </ul> <p>Please send your resume and salary history to:</p> <p>James H. Ambler, Vice President 1076 E. Meadow Circle Palo Alto, Calif. 94303</p> <p><b>REMOTE COMPUTING CORPORATION</b></p>	<p><b>MANAGER COMPUTER OPERATIONS</b></p> <p>LARGE CHICAGO FINANCE ORGANIZATION HAS IMMEDIATE OPENING FOR MANAGER OF COMPUTER OPERATIONS.</p> <p>As Manager of Computer Operations, you will be immediately responsible for an OS/MVT shop - three shifts per day, 7 days per week, currently in the process of converting to 370/158's by second quarter of 1974.</p> <p>The ideal candidate is now managing at least 12 computer operators in a multi-computer OS environment earning a minimum of \$15,000 a year. Submit resume to:</p> <p>BOX 7765 Chicago, Illinois 60680 An Equal Opportunity Employer</p>	<p><b>UNUSUAL SYSTEMS OPPORTUNITY</b></p> <p>How would you like to be the PROJECT LEADER in the development and implementation of a complete data processing-teleprocessing system for a \$10 million East Coast affiliate of a \$100 million Corporation?</p> <p>If you have a Bachelor of Science degree in Business or a technical discipline and 3-5 years of business systems experience, including at least a year in small systems - have dealt with order entry-inventory problems - have the capability of leading people - have programmed in RPG II as well as COBOL - and, can effectively communicate data processing activity and needs with Management in understandable terms ...</p> <p>We would like very much to talk with you.</p> <p>This project is of limited duration ... 1 1/2 - 2 1/2 years, at which point you will have the option of transferring to our Corporate headquarters located on the San Francisco Peninsula.</p> <p>We offer an exceptionally exciting, high growth opportunity with excellent compensation to a special individual for a special Company - RAYCHEM CORPORATION.</p> <p>RAYCHEM CORPORATION is a leader in the field of radiation chemistry with an expanding product line including electrical termination and interconnection systems, high performance wire and cable, heat shrinkable polymers and memory metals. RAYCHEM CORPORATION grows at 25% each year due in major part to our constant technological innovations.</p> <p>If you would like to learn more about us and this opportunity, please forward your resume immediately to C. Crispel, Selection and Development, RAYCHEM, 300 Constitution Drive, Menlo Park, CA 94025. An equal opportunity employer.</p> <p><b>RAYCHEM</b></p>
			<p><b>Senior Programmers</b></p> <p><b>Programmers</b></p> <p>Professional growth opportunity in design and implementation of large-scale systems. You should have a minimum of two years heavy COBOL (preferably ANS) programming experience for a variety of business applications on large-scale systems. Computer Systems Technical Design and/or EXEC-8 experience an asset. Degree preferred.</p> <p>In addition to excellent starting salaries and an attractive benefit package, Pitney Bowes, a leader in innovative business equipment, offers wide-ranging career advancement opportunities coupled with an uncommon degree of personal visibility. Please send your resume, including salary history and requirements, in complete confidence to:</p> <p>Miss Susan Kay Professional Employment Specialist</p> <p><b>Pitney Bowes</b> Walnut &amp; Pacific Streets, Stamford, Conn. 06904 An Equal Opportunity Employer</p>	

October 17, 1973

**COMPUTERWORLD**

Page 33

**POSITION ANNOUNCEMENTS****POSITION ANNOUNCEMENTS****POSITION ANNOUNCEMENTS****COMPUTER SYSTEMS ANALYSTS**

Upgrade Your EDP Systems Career With The City of Phoenix

**In Arizona —**

The location's great for EDP specialists with two years EDP systems experience including programming. Two positions available in public safety division with police systems experience preferred. One vacancy with large-scale data base design/documentation experience preferred. Salary \$12,189 — \$15,309. We offer the career you've been looking for... in the climate you've always envisaged!

For immediate consideration, send your resume in confidence to: City of Phoenix, Personnel Department, 251 West Washington, Room 500, Phoenix, Arizona 85003.

**City of Phoenix**  
"Your Place in The Sun"  
An Equal Opportunity Employer

**SEATTLE POSITIONS**

Keep your career moving — in the beautiful Pacific Northwest. Consider joining our particularly successful firm in a multi S/370 environment utilizing IMS, TSO, etc. for the development of leading edge applications. Excellent working conditions and benefits with challenging work as the focal point.

We will consider people, for additions to our staff, who have 2 or more years experience as a Programmer, Programmer-Analyst or Systems Analyst. We would prefer individuals with some connection to the Northwest. Please contact Mr. James Borden, Personnel Department, (206) 545-5646.

**SAFECO INSURANCE**  
Safeco Plaza Seattle, Washington 98185  
an equal opportunity employer

**SENIOR SYSTEMS ANALYST**

Look to Arizona for your new Home and Career With

**MOTOROLA**

Our epitaxial materials engineering department in Phoenix is looking for a Senior Systems Analyst who is experienced in real-time, process control and engineering systems. The successful candidate will be involved in designing engineering support systems for both real/time and batch.

At Motorola in Phoenix you'll have the best of both worlds. You'll live and work in Arizona — smog free and sun filled. And you'll be receiving the best benefits and salaries anywhere. As for advancement — no problem — there's plenty of opportunity... at Motorola.

If you're interested in furthering your career and your personal lifestyle, send your resume in complete confidence to Motorola Semiconductor Products Division, 5005 E. McDowell Road (U114), Phoenix, Arizona 85008.

We are an Equal Opportunity Employer

**MOTOROLA INC.**  
Semiconductor Division

**BANKING DP PROFESSIONALS****DID YOU KNOW?**

- That UCC is the leading computer service organization in the banking industry.
- That UCC has pioneered development of the Total Bank System line of integrated banking systems.
- That UCC serves over 70 of the largest banks and financial institutions in the nation.
- That UCC operates its own Banking Institute with a faculty and curriculum equivalent to that of the better graduate schools of banking and that this school is dedicated to the training of UCC Banking Division personnel.
- That UCC is continuing to expand its commitment to the banking industry through the introduction of new services such as Custom Installation Support.

**.IF YOU LIKE**

- The Challenge of fast-breaking technological changes in the Banking Industry.
- Working with customers who are data processing professionals to implement advanced banking systems.
- The excitement of travel.
- The responsibility associated with individual or small group assignments.

**IF YOU HAVE**

- A proven track record as a computer professional.
- Specific experience in banking computer applications.
- The ability to work well with customers.
- The potential for increasing responsibility in a rapidly growing organization.

**THEN**

- We want you to contact us about these challenging positions open in the Banking Division of UCC.

**Banking Specialists**

Burroughs Programmers Systems Analysts

**Programmers**

- To confidentially explore these career positions at our Midwest, Southwest, Western and Eastern locations, please rush your resume with your salary requirements to: Mr. Ed Lott, P.O. Box 47911, Dallas, Texas 75247

**UCC**  
**UNIVERSITY COMPUTING COMPANY**

an equal opportunity employer

**Buy Sell Swap****FOR SALE OR LEASE**

1401 1440  
1410  
Corporate Computers, Inc.  
420 Lexington Ave.  
New York, N.Y. 10017  
(212) 532-1200

**FOR SALE**

IBM #402 — \$1100  
IBM #403 — 1600  
IBM #514 — 1200  
IBM #519 — 1500  
IBM #082 — \$1000  
IBM #077 — 500  
IBM #602 — 350

All machines are in excellent condition. Boards & wires available.

**DATA FRANCHISORS INC.**  
(201) 469-4070  
Central Jersey Ind. Park  
Bldg. 27E, Kearney St.  
Bridgewater, N.J. 08805

**Wanted**

for  
Immediate Purchase or Lease Assumption  
Calcomp 2314 Type Disk Drives and/or Disk Controllers  
All Deliveries Required To Buy-Sell-Lease  
Call collect or write to:  
Computer Systems Graphics, Inc.  
20 West 9th Street  
Kansas City, Missouri 64105  
(816) 474-4690

**Computerworld**  
**Sales**  
**Offices**

**Vice President — Sales****Sales Administrator:****Dottie Travis**

COMPUTERWORLD  
797 Washington Street  
Newton, Mass. 02160  
(617) 965-5800

**Northern Regional Manager****Robert Ziegel****Account Manager****Mike Burman**

COMPUTERWORLD  
797 Washington Street  
Newton, Mass. 02160  
(617) 965-5800

**Eastern Regional Manager****Donald E. Fagan****Account Manager****Frank Gallo**

COMPUTERWORLD  
225 West 34th Street  
Suite 1511

New York, N.Y. 10001  
(212) 594-5644

**Los Angeles Area:****Bob Byrne**

Robert Byrne & Assoc.

1541 Westwood Blvd.

Los Angeles, Calif. 90024

(213) 477-4208

**San Francisco Area:****Bill Healey**

Thompson/Healey Assoc.

1111 Hearst Bldg.

San Francisco, Calif. 94103

(415) 362-8547

**Japan:****Ken Suzuki****General Manager**

Dempa/Computerworld

1-11-15 Higashi Gotanda

Shinagawa-ku, Tokyo 141

**BUY SELL SWAP****FOR SALE**

IBM 1440  
1441 12K CPU, 1442 Reader,  
1443 Printer, 1444 Punch,  
1447 Console with Inquiry,  
(3) 1311 Disk Drives, 50  
Packs.

IBM maintenance. Complete proven software for multi-warehouse order entry, billing, receivable and inventory control. Available immediately.

**Finserv Computer Corp.**  
1462 Erie Boulevard  
Schenectady, N.Y. 12305  
(518) 374-4430

**FOR SALE BEST OFFER**

IBM 7040 COMPUTER  
HARDWARE CONSISTING OF THE FOLLOWING MACHINES:  
7106-003 (with 1038, 1040,  
3880, 4428, 7498); 1402-002;  
1403-002; 1414-001 (with  
7814); 1414-004 (with 6025,  
7680, 7681); (4) 7330-001s;  
(2) 0729-002s

UNDER IBM MAINTENANCE CONTRACT SINCE INSTALLATION  
Bids Must be in by November 15, 1973  
Contact:  
**MARQUETTE UNIVERSITY PURCHASING DEPARTMENT**  
1324 W. Wisconsin Ave.  
Milwaukee, Wisc. 53233  
(414) 224-7453

Before You Buy — Lease —  
Sell — 360 • 370 • 1401 •  
IBM Unit Record Equip.

Please Call or Write

**COMPUTER CLEARING CORPORATION**  
2600 Arroyo, Suite 124  
Dallas, Texas 75219  
Dallas, (214) 528-5087  
Chicago, (312) 642-5103

"We guarantee delivery at a fair market price."  
— George Jachimiec, President

**FOR SALE OR LEASE****IBM 360/20 SYSTEM**

\*\*\* D.P. Equipment  
Marketing Corp.  
260 W. Broadway, N.Y. N.Y.  
CALL (212) 925-7737 Ext. 1

**FOR SALE****029's A-22  
029's B-22  
059's Mod 2**

Immediate Delivery

**CMI Corporation**  
16225 E. Warren Avenue  
Detroit, Michigan  
(313) 889-0440

**FOR SALE**

One Gould 4800 Printer  
complete with:  
• Program controlled paper cutter  
• Gould Printer interface for IBM 360/65  
• Magnetic tape handler  
Write or Call: Eugene V. Moss  
CHEMICAL ABSTRACTS SERVICE  
The Ohio State University  
Columbus, Ohio 43210  
(614) 421-6940 Ext. 2925

**NEED TO BUY**

059-557-082-029-526

**SALE OR LEASE**

Reconditioned Machines  
029-\$1850; 026-\$1450; 077-\$1000;  
082-\$1300; 083-\$2900; 085-\$2000;  
552-\$1600; 402-\$1200; 407-\$2500  
DATA RENTALS, INC.  
2919 S. La Cienega Blvd.  
Culver City, Calif. 90230  
(213) 559-3822

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP
<p><b>Are you familiar with one of the largest volume data conversion houses in the Midwest?</b></p> <ul style="list-style-type: none"> <li>• Key Punch — Key-to-Tape — Clerical</li> <li>• Guaranteed delivery — competitive pricing</li> <li>• Daily service in the major Midwest metropolitan areas</li> </ul> <p>Write for brochure or call collect:  <b>JANESVILLE DATA CENTER, INC.</b>    P.O. Box 43    Janesville, Wis. 53545    (608) 754-2838</p>	<p><b>WE PURCHASE 360/20/30 WE LEASE &amp; SELL 360/20/30</b></p> <p><b>THIS WEEK 029 B-22 SPECIALS: 059 M-2</b></p> <p><b>For Sale</b>    029, 059, 083, 084, 026, 557    All 360/20 Systems</p> <p><b>SIMPLICITY COMPUTER CORP.</b>    257 W. 39th Street    New York, N.Y. 10018    (212) 695-3010</p>	<p><b>DISC &amp; DRUM TOTAL REFURBISHMENT</b></p> <ul style="list-style-type: none"> <li>• Replating and Texturing</li> <li>• New bearings</li> <li>• Electronic balancing</li> <li>• R/W head inspection, replacements and adjustments</li> <li>• Clock writing</li> <li>• Factory level testing</li> </ul> <p>(213) 889-6031</p>	<p><b>1400-360 Specialists in 1401, 1440 360/20, 360/30</b></p> <p><b>Hundreds of Satisfied Users</b></p> <p><b>Free Appraisal Service BUY-TRADE SELL-LEASE Call us last but Call Us!</b></p> <p><b>CMI CORP.</b>    Area Code 313-889-0440    16225 E. Warren Avenue Detroit, Mich. 48224</p>	<p><b>FOR SALE OR LEASE IBM 1401 SYSTEMS</b>    with or without Tape Drives &amp; Disks Savings in thousands</p> <p><b>D.P. Equipment Marketing Corp.</b>    260 W. Broadway, N.Y. N.Y.    CALL (212) 925-7737 Ext. 1</p> <p><b>For Sale IBM 3330 Disk Storage Subsystem</b></p> <ul style="list-style-type: none"> <li>• IBM 3830-1 &amp; three 3330-1's. Available for purchase.</li> <li>• Availability date — 60 days.</li> <li>• Purchase price substantially below IBM list.</li> <li>• Maintenance Provided by IBM</li> </ul> <p>Write CW Box 3946    797 Washington Street Newton, Mass. 02160</p>
<p><b>WE WANT TO BUY MINI COMPUTERS and Peripherals</b></p> <p><b>WE ALSO SELL THE ABOVE CALL OR WRITE FOR FREE BROCHURE NEWMAN COMPUTER EXCHANGE, INC.</b>    222 North Seventh Ann Arbor, Michigan 48103 (313) 761-0984</p> <p><b>For Lease 370/135</b>    Available — 120 Days</p> <p>Charles Diesges (212) 956-2858    Steve Zaleskie (212) 956-4170</p> <p><b>Principals Only</b></p> <p>Talcott Computer Leasing Division of James Talcott, Inc. 1290 Avenue of the Americas New York, N.Y. 10019</p> <p>Member — Computer Lessors Association</p>	<p><b>ACS FOR SALE</b>    1412 Sorter Reader Avail — Dec</p> <p>2415-1 Tape Drive Avail — Now</p> <p>082, 602, 552, 514    407-A2, 403-A1 w/Cad    083 w/Alpha &amp; File Fd</p> <p><b>COMPLETELY REFURBISHED ON M/C AVAIL. IMMEDIATELY.</b></p> <p>ACS Equipment Corporation    8928 Spring Branch Drive Houston, Tx 77055 (713) 461-1333</p> <p><b>Current Inventory SALE</b>    All this Unit Record Equipment in stock and ready to ship at money saving sale or lease prices.</p> <p><b>RARELY OFFERED</b>    046, 047, 029, 059, 407, A3, 548, 557, 087, 088    MARK SENSE 519    OTHER FINE MODELS:    024, 026, 056, 077, 085,    402, 403, 407, 514, 519,    523, 552, 602, 604, 521, 826</p> <p><b>III D.P. Equipment Marketing Corp.</b>    260 W. Broadway, N.Y. N.Y. (212) 925-7737 Ext. 1</p> <p><b>FOR SALE</b>    360/20    2501A2, 2520A2    1403-2, 2-2311  <b>MAKE OFFER</b></p> <p><b>SYSTEMS MARKETING, INC.</b>    3930 E. Camelback Road Phoenix, Ariz. 85018    Contact:    Robert R. Russel (602) 956-8470</p>	<p><b>SALE/LEASE</b>    360/20's    C1-8K, 1403-7, 2560 A-1    D2-16K, 1442-5, 2501 A-1 — 1403-2    (2) 2311-11, 2415-1    OTHER MODELS AVAILABLE    1401 C 3, 1402-1, 1403-2    360/30's, 40's, 50's with I/O sets    370-145's, 155's</p> <p><b>BUY</b>    All model 360/20's, 360/30's, 40's, 50's and 65's    370's and System 3's    All peripherals and unit record equipment</p> <p><b>CROSS COMPUTER CORPORATION</b>    360/370 &amp; SYSTEM 3 FINANCING AVAILABLE    PHILADELPHIA (215) 568-6620    NEW YORK (516) 487-9812    505 Northern Blvd.    Great Neck, N.Y. 11021</p> <p><b>SPECIALISTS IN IBM 360/370, UNIVAC &amp; HONEYWELL PURCHASE &amp; LEASE</b></p> <ul style="list-style-type: none"> <li>• IBM 360/30 96K Many features \$1525 per month</li> <li>• Univac 1108 262K with 3 subsystems Loaded. \$24,830 per month</li> <li>• Univac 70/46 loaded. \$12,000 per month</li> <li>• Univac 9300 16K with 2 tapes. \$1025 per month</li> <li>• Univac refurbished 1004's and DLT-1 &amp; DLT-3.</li> </ul> <p>For information on the EDP equipment exchange service contact:    Gary Johnston    Free Appraisal</p> <p>American Computer Exchange    24500 Chagrin Blvd.    Beachwood, Ohio 44122    (216) 464-3881</p>	<p><b>FOR LEASE 360/65</b></p> <p>(2) 2365 Storage (512K)    (1) LCS Adapter    (1) 2870 MUX Channel 2 with 2 Selector Sub-Channels    (2) 2860 Selector Channels Available April 1974    CW Box 3944    797 Washington Street Newton, Mass. 02160</p> <p><b>XIOX CORPORATION</b>    360/30'S    E's and F's    Contact Tom Larsen    305-358-3631</p>	<p><b>ATTENTION END USERS</b></p> <p><b>7 360/65's for Sale Delivery: October thru February</b></p> <p>We want to buy 360's, 370's and peripherals.</p> <p><b>THE COMPUTER EXCHANGE INC.</b>    8105 Edgewater Dr. Oakland, Ca. 94621 (415) 638-9005 11 Grace Ave. Great Neck, N.Y. 11021 (516) 466-6500</p> <p><b>360-370 marketplace BUY • SELL • LEASE</b></p> <p><b>TLW COMPUTER INDUSTRIES INCORPORATED</b>    BRANCH OFFICE: 222 E. Wisconsin Ave. Lake Forest, Ill. 60045 (312) 295-2030    BRANCH OFFICE: 3031 Tisch Way Executive Suite 13 San Jose, Calif. 95128 (408) 249-0110    3570 AMERICAN DRIVE • ATLANTA, GEORGIA 30341 • 404/451-1895</p> <p><b>FOR SALE UNIVAC SPECTRA 70</b>    70/45 System \$95,000    70/35 System \$67,500    Tape, Card, Disk, Printer, Video    418-II    1004-II &amp; 1005-III Tape Upper/Lower Case  <b>9200 CARD SYSTEMS UP TO 75% OFF</b></p> <p><b>IMMEDIATE DELIVERY IBM 360/25 CPU</b>  <b>360/65 (I) CPU</b>    2311/2841 Disk &amp; Ctrl.    2250 Graphics Display    2260/2848 Display &amp; Ctrl.    2401-5 Tapes, (Dual Density)    System 3 BI/SYNCH</p> <p><b>200 Series Units HONEYWELL</b>    CPU, CARD, TAPE, DISK PRINTER, COMMUNICATIONS  <b>115-2 SYSTEM \$85,000</b>    32K CPU, CARD I/O, (3) DISK DRIVES and 1100 LPM Printer</p> <p>We have <b>DISK PACKS</b>    Send for FREE Reprint "Maintenance of Computers"</p> <p><b>AMERICAN USED COMPUTER CORPORATION</b>    P.O. BOX 68, KENMORE STATION, BOSTON, MASSACHUSETTS 02215 TWX: 710-321-6388</p>
<p><b>LEASE BUY SELL</b>    DEAL WITH PROFESSIONALS IN PLACEMENT OF</p> <p><b>PRE-OWNED 360 EQUIPMENT</b>    "The Nations Largest Wholesale Dealer"</p> <p><b>computer wholesale corp.</b>    SUITE 461-481 NATIONAL BANK OF COMMERCE AREA 504 581-7741    NEW ORLEANS, LA. 70112</p> <p><b>SYSTEM 360/370</b></p> <p>A business relationship you can't afford to be without . . .</p> <ul style="list-style-type: none"> <li>• Lease Terms to Fit Your Needs</li> <li>• Field Engineering Support</li> <li>• Systems Engineering Support</li> <li>• Well Trained Marketing Staff</li> <li>• Buy and Sell 360s</li> <li>• Subleasing</li> <li>• Member, Computer Lessors Association</li> </ul> <p><b>Dearborn Computer Leasing Corporation</b>    a subsidiary of Dearborn-Storm    4849 North Scott Street / Schiller Park, Illinois 60176 Area 312 / 671-4410</p>	<p><b>FOR SALE UNIVAC SPECTRA 70</b>    70/45 System \$95,000    70/35 System \$67,500    Tape, Card, Disk, Printer, Video    418-II    1004-II &amp; 1005-III Tape Upper/Lower Case  <b>9200 CARD SYSTEMS UP TO 75% OFF</b></p> <p><b>CALL 617-261-1100</b></p>			

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP
<b>Don't discount System/360.</b> Let us do it for you.   <b>Call 914-428-3804</b>	We lease 360/30's and 360/40's at low, low prices. CPU's and complete systems. Contact us today!  EDP Resources Inc. One North Broadway White Plains, N.Y. 10601  <b>Call 914-428-3804</b>	<b>UNIVAC 1004/1005</b>  • Buy/Sell/Lease • Refurbish/Overhaul/Maintain • System Upgrades • 90 to 80 Col. Conversions • 80/90 Col. Parts Available Contact M.A. Jarrett	<b>CORE MEMORY REPAIR</b>  • Cleaning • Core replacement • Restrung • Factory level testing (213) 889-6031	<b>For lease by owner 360/30 E or F</b>  Available immediately with any features. I/O set and peripherals also available.  <b>EDP RESOURCES INC.</b> One North Broadway White Plains, N.Y. 10601 (914) 428-3804
<b>SALE OR LEASE</b> 360 Systems, 1401 Systems 2400 Tape Drives, 2311 Disk Drives 1620 Systems, 029, 206, 059 All Types Unit Record Equip., Incl. 082, 083, 402, 407, 514, 519, 557	<b>EQUIP. WANTED</b> 360 Systems, 1401 Systems Tape Drives All Types Of Card Equipment 029, 059, 026	<b>MAINTECH INC.</b> 1133 Ave. of the Americas New York, N.Y. 10036 (212) 586-2823	<b>32K 360/30 CPU FOR SALE</b>  1.5 us One Selector Channel Decimal Arithmetic Floating Point 1051/1052  Immediate Delivery, subject to prior sale or withdrawal \$45,000 Full IBM Maintenance	<b>32K 360/30 CPU FOR SALE</b>  1.5 us One Selector Channel Decimal Arithmetic Floating Point 1051/1052  Immediate Delivery, subject to prior sale or withdrawal \$45,000 Full IBM Maintenance
<b>SPECIAL SALE</b> 360 (30) Sys. 1620 Disk Sys. 1401-8K I.O. Set 1443 Printer 729-Tapes 2311 Disk Drives	<b>dpa</b>  • DPA with offices in most major cities now offers IBM equipment completely reconditioned prior to shipment. • Member Computer Lessors Assn. • Call or Write DPA Inc. 2636 Farrington St., Dallas, Texas 75107 (214) 637-0950	<b>data sales co.</b> BUY • SELL • LEASE IBM 360/370 <b>SYSTEM 3 MEMORY</b> Call or Write 13200 Penn. Ave. So. Burnsville, Minn. 55337 (612) 890-8838	<b>data sales co.</b> BUY • SELL • LEASE IBM 360/370 <b>SYSTEM 3 MEMORY</b> Call or Write 13200 Penn. Ave. So. Burnsville, Minn. 55337 (612) 890-8838	<b>tbi</b> TBI Equipment Div. Time Brokers, Inc. 500 Executive Blvd. Elmsford, N.Y. 10523 (914) 592-4065  Nationwide broker/dealers of DP equipment & computer time Boston, Chicago, Elmsford, N.Y., Los Angeles, New York City, and Washington, D.C.
<b>BEFORE YOU BUY</b>  <b>GO GREYHOUND</b>  <b>WANTED</b> All 370's 360/65's and 360/50's	<b>FOR SALE</b> 2303F, 2821-1, 2540-1, 1403-N1, and Tape or Disk to your specifications Immediate Delivery  A member of the Computer Lessors Association Director - Equipment Sales Greyhound Computer Corporation Greyhound Towers Phoenix, Arizona 85077 Phone 602) 248-5972	<b>WANT TO PURCHASE</b> <b>HONEYWELL 200 SYSTEM</b> Call or Write Van R. Perkins CIMARRON EQUIPMENT LEASING COMPANY 711 Thurston Nat'l. Bldg. Tulsa, Oklahoma 74103 (918) 584-0073	<b>WANT TO PURCHASE</b> <b>HONEYWELL 200 SYSTEM</b> Call or Write Van R. Perkins CIMARRON EQUIPMENT LEASING COMPANY 711 Thurston Nat'l. Bldg. Tulsa, Oklahoma 74103 (918) 584-0073	<b>BUY - SELL - LEASE - TRADE</b>  <b>AVAILABLE IMMEDIATELY PERIPHERALS</b> CPUs 2020-8K SYSTEM 2030-2MIC 2030-1.5MIC 2040-(64-256K) 2050-(128K-512K) 2065, 2860-3, 2870-1  IBM CORE 30, 40, 50 2365-2 or 13 3360-3  370/155-AVAILABLE DEC. 370/155-AVAILABLE MAR.
<b>buy·lease·sell</b> 370 & 360 EQUIPMENT  Branch Offices: HARTFORD, CONN. PITTSBURGH, PA. WASHINGTON, D.C.  <b>CIS</b> CONTINENTAL INFORMATION SYSTEMS CORPORATION  MIDTOWN PLAZA, SYRACUSE, NEW YORK 13210 (315) 474-5776	<b>ACS HONEYWELL</b> 1200 - 32K 4 - TAPE 2 - DISC  AVAILABLE NOW PRICED TO MOVE!! FOR SALE or LEASE or LEASE/PURCHASE  ACS Equipment Corporation 8928 Spring Branch Drive Houston, Tx 77055 (713) 461-1333	<b>UNIT RECORD EQUIPMENT SPECIALIST FOR SALE</b> 029-A12, 059-02, 407A1, On M/A.  <b>WANT TO PURCHASE</b> Keypunches, Verifiers, Sorters, Collators, Peripheral Equipment.  Contact: Jordan Halper <b>Halper Computer Sales Co.</b> 15 West 44th Street New York, N.Y. 10036 (212) 869-0599	<b>WHO IS...</b> The Major Financial Institution Leasing S/360's and S/370's in the U.S. Today?  First National Boston (FNB), a top-ranking international financial institution with assets of over \$6.3 billion, is now leasing IBM S/360 and S/370 computers and peripherals through an FNB affiliate, Randolph Computer Company. FNB's entry into computer leasing now provides the solid financial base required for highly flexible short and long-term computer leasing of IBM computers and peripherals by IBM users.  During 1972, leasing of S/360 and S/370 CPUs and peripherals saved Randolph's computer-leasing customers over \$22 million in rentals... in just one year. These users of Randolph's computers, who number over 200, are distributed across all of the 12 major U.S. industry sectors, with small firms as well as large corporations sharing in cost-saving leases from Randolph. Financial institutions, too — the professional money managers — are well represented among the EDp users who analyzed financial alternatives, then selected the most flexible lease plan for them: a plan designed by RCC for their changing needs.  For your up-to-date lease plan, contact RANDOLPH, THE COMPUTER LEASING COMPANY, now!	
<b>FOR LEASE OR SALE</b>  360-40-G-22580 with features 3237 6980 4427 6981 4457 7520 4460 7920 4462 1052-7 Available Nov. 1973  1316-DISK PACKS-\$20.00 2315-DISK PACKS-\$35.00 2316-DISK PACKS-\$75.00	2401-2-9 Track with features 7160 360-20-8K System 2560 2203 2501 Available Mar. 74  Lease - \$4.00 Month Lease - \$5.00 Month Lease - \$7.50 Month	<b>For Lease</b> <b>360/65</b> <b>360/50</b> <b>360/40</b> Configured To Your Requirements Charles Dieges (212) 956-2858 Steve Zaleskie (212) 956-4170  <b>Talcott Computer Leasing</b> Division of James Talcott, Inc. 1290 Avenue of the Americas New York, N.Y. 10019  Member — Computer Lessors Association	<b>OFFICES IN ELEVEN CITIES</b> <b>Northeast:</b> 537 Steamboat Rd. Greenwich, Ct. 06830 (203) 661-4200 621 Country Club Rd. Avon, Ct. 06001 (203) 673-0435 20 Cornell Place Englewood, N.J. 07626 (201) 446-6300  <b>Midwest:</b> 8060 Montgomery Rd. Cincinnati, Ohio 45236 (513) 793-6060 625 N. Michigan Ave. Chicago, Ill. 60611 (312) 787-4224  <b>Southwest:</b> 1545 W. Mockingbird Lane Dallas, Texas 75235 (214) 637-3680  <b>West:</b> One Wilshire Blvd. Los Angeles, Ca. 90017 (213) 680-9195 525 University Ave. Palo Alto, Ca. 94301 (415) 327-2780  <b>Southwest:</b> 1800 Peachtree Ctr. Atlanta, Ga. 30303 (404) 688-6932  <b>530 "B" Street</b> San Diego, Ca. 92101 (714) 232-6401	
<b>WANTED</b> 360 Systems I/O Sets 029-B22 029-C22	All Types of Card Equipment 1401 Systems Tapes & Controllers			
<b>DATA AUTOMATION SERVICES, INC.</b>  Home Office 4858 Cash Rd. Dallas, Tex. 75247 214-637-6570				
318 W. 28th St. Los Angeles, Ca. 90007 213-747-0587				

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP
<b>FOR SALE</b> Univac 9480 Honeywell 200 6 IBM 2401-02 <b>WANTED</b> 1106 Memory 8414 Disks Fastrand Drums Call <b>UNIT RECORD SERVICE</b> 84 Cummings Park Woburn, Mass. Call (617) 935-6340	<b>FOR SALE OR LEASE</b> 024-\$350; 026-\$1300; 056-\$250; 077-\$550; 082-\$900; 083-\$2600; 085-\$1500; 088-\$4000; 402-\$1300; 403-\$1400; 407-\$3000; 514-\$1250; 519-\$1500; 548-\$2300; 552-\$1400; 557-\$3700; 602-\$400; 2311 (1) \$4000; 729(5)-\$2500; 729(6)-\$2500; 1448-\$1000; 1401 system-\$14,000.	<b>IBM</b> Qty. Type Mod. Description (1) 2030 FOO Proc. Unit 64K 3237 Decimal Arith. 4427 Floating Pt. Arith. 6960 1st Sel. Chan. 7915 1051 Attachment Control Unit 3130 CPU Attachment 4410 Attach. 1st Punch 4411 Attach. 1st Reader (1) 1052 8 7520 Storage Protect Control Unit 3615 1101 LPM Prntr/ Adap. (1) 2540 1 Card Read Punch (1) 1403 N1 Printer (1) 2803 2 Tape Control 5320 9 Track. Compati. (4) 2401 4 Mag. Tape Unit (4) 2314 Disk Units (1) 2319 Control Unit "Please No Brokers" Joseph D. Sullivan Vice-President-Sales Computer Data Services 8238 Winton Road Cincinnati, Ohio 45231 (513) 792-1415	<b>WANTED</b> <b>TELETYPE® EQUIPMENT</b> New • Used • Parts — ALSO — • Data Terminals • Peripherals • Mini-Computers • Modems Contact us for data terminal sales, service, supplies and rentals.  TERMINAL SYSTEMS INC. 11300 Hartland St. N. Hollywood, Calif. 91605 213-769-6772 TWX 910-499-2675	We <b>buy</b> and <b>sell</b> IBM Computer Systems & Unit Record Machines NCR 31-32-33-395-400 Burroughs - L Series  84 Kennedy St. Hackensack, N.J. 07601 (201) 343-4554
<b>SYSTEM 360/50</b> Terminal, remote processing or on site availability. Convenient downtown location. Call Donald Gilchrist - 296-5746 Image Processing Inc. 1747 Pa. Ave., N.W., Washington, D.C. 20006		 SPECIALISTS IN 370 CORE 3360/003 3360/005	<b>We Need:</b> 1419 MOD 1 1442-N2 FOR BETTER VALUE LOOK TO: <b>cac</b>	<b>Available:</b> 370/155J 360/50-512K 360/40-64K 360/40-128K 360/40-196K 360/30-32/64K As a package: 2401-IV, 2402-IV, 2403-IV.
<b>BUY-SELL-LEASE</b> 360/20  360 30/40/50 65 1130 <b>ECONOCOM</b> Division of Cook Industries, Inc. 2185 Democrat Road - P.O. Box 16902 Memphis, Tennessee 38116 901-396-8890 or 901-396-8600		<b>BUY • SELL TRADE</b> • LEASE ANY EDP EQUIPMENT  <b>Leasing</b> Dynamics Inc. 3101 Euclid Ave. Cleveland, Ohio 216-687-0100	<b>BUY SELL LEASE</b> 1410 7074 729's 360/50, 512K, Late 73 370's & 360's Systems and Components Minis & Teletypes  <b>EBM</b> 220 HARVEST AVE. STATEN IS., N.Y. 10310 (212) 273-3636	<b>BUY • SELL • LEASE</b> <b>IBM 360/370</b> IPS is the oldest dealer in used IBM equipment in the world. We have an experienced staff, hundreds of satisfied users, and a stable financial base. IPS carries a multi-million dollar inventory and is always prepared to buy or sell 360 or 370 equipment. On any 360 or 370 purchase, sale, or lease, call or write IPS for a realistic and competitive quote. <b>IPS COMPUTER MARKETING CORP.</b> 467 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (201) 871-4200, TWX (710) 991-9677
<b>DISK DRIVE SALE</b> 2311 MOD 1 or 11 \$3500.00		<b>FOR SALE OR LEASE</b> IBM 1410 COMPLETE TAPE AND DISK SYSTEM BARGAIN PRICED *** D.P. Equipment Marketing Corp. 260 W. Broadway, N.Y. N.Y. CALL (212) 925-7737 Ext. 1	<b>360 * BUY * 370</b> * SELL * * TRADE * * LEASE/SUBLEASE *	<b>buy • sell • lease • trade</b> <b>360/40 CORE</b> IBM MANUFACTURE ALL INCREMENTS, INCLUDING 256-384 LOWEST PRICES EVER
<b>COMPLETELY REFURBISHED</b> AND RECONDITIONED ELIGIBLE FOR IBM MA		<b>AVAILABLE</b> Central Processors 2030F 65K loaded 2 chan. 2030E 32K 1 chan.-SP 2040G 128K 2 chan. 2040G-to-1+ 256K IBM core Printers-Readers-Punches 1/2/1403-N1 Printers 2821-1 Controller 1/2/2821-2 Controller 2540-1 Reader/Punch 2501-B2 1000 CPM Reader 1442-N2 160 CPS Punch Disk 2314-A1 4-6-8 Spindles 2314-A2 9 Spindles 2841-1 Controller 2841-2 Disk (4)2311-1 Tapes 2404-3 Control & 90KB drive 2402-3 Two 90KB drives 2401-3 90KB drive 1/2/2403-2 Control & 60KB drive 2/2/2401-2 60KB drives 2404-1 Control & 30KB drives 2402-1 Two 30KB drives 2401-1 30KB drive 2415-5 Control & four 1600 BPI drives 90KB MAI drives (7) 2403 Misc. 2701-1 Data Adapter 2701-2 Two 7698 lines 2701-3 Data Adapter 2911-1 One 7698 Switching Unit 2-by-4	<b>IBM 1403,</b> <b>1100 LPM PRINTERS</b> <b>2501-A1 CARD READER</b> <b>dataserv equipment inc.</b> Call Collect ..... 612-546-4422 Or Write ..... 400 Sheland Plaza, Suite 415 Minneapolis, Minnesota 55426	
<b>DAS</b> 4858 CASH ROAD DALLAS, TEXAS 75247 214-637-6570		LUNCEFORD & ASSOCIATES Valley View Bank Bldg. Overland Park, Kan. 66212 (913) 381-7272		

TIME FOR SALE	TIME FOR SALE	SOFTWARE FOR SALE	SOFTWARE FOR SALE
<b>Time for Sale</b>			
<b>TEXAS</b>			
<b>COMPUTERISTIC<sup>S</sup></b> <small>SUBSIDIARY OF UNIROYAL</small> Computer Time IBM 360/40 - 128K 4-Dual Density Tape Drives 2314 2 - 1403-N1 2540 Partition Time - All Shifts Stand-alone - Evenings & Weekends Call Richard Keithly (713) 526-2861 Houston, Texas	<b>NEW YORK</b>  <b>Thomas National, Inc.</b> 1775 Broadway, N.Y.C.  <b>370/145</b> <b>DATACENTER</b> OS-VS - HASP RJE Turnkey Responsibilities DOS Emulation 3330's and 2314's Systems and Programming Support Data Entry Services Convenient Midtown Location Open 24 Hours Per Day Call (212) 765-8500	<b>ILLINOIS</b>  <b>360/65</b> <b>OS-MVT-HASP</b> We will give flat price contracts on jobs regardless of how much running time is involved. HF/II APT MPSX ICES BLISS CROSSTABS PICS PAYROLL SSP MPS PLAN SAS BMD PROJECT II ACCOUNTS PAYABLE ACCOUNTS RECEIVABLE GENERAL LEDGER General Purpose Simulation System Continuous System Modeling Program Urban Transportation Planning System 360 Block Time and Remote Batch Your Programs or Ours <b>USE OUR NETWORK OF BATCH TERMINALS AND 4800 BAUD LEASED LINES CONNECTING THE FOLLOWING CITIES:</b> • CHICAGO • NEW YORK • CLEVELAND • ST. LOUIS • MILWAUKEE • LOS ANGELES  <b>StateCom</b> A Division of Statistical Tabulating Corp. (312) 346-7300 Vern Brownworth	<b>PAYROLL PERSONNEL ACCOUNTS PAYABLE</b> Modular, flexible systems with multi-company capabilities. Presently functioning for a variety of users. All programs written in COBOL.  <b>ARGONAUT INFORMATION SYSTEMS, INC.</b> POST OFFICE BOX 112 WALNUT CREEK, CA. 94596 (415) 937-4675
<b>MICHIGAN</b>			<b>AUTOCODER &amp; SPS TRANSLATED AUTOMATICALLY to BAL &amp; PL/1</b> THE <b>TOTALTRAN</b> SYSTEM ... The most economical, practical and quickest method of converting to the 3rd and 4th generation. <b>3 SERVICES OFFERED:</b> 1. 1400 Object to clean source de- compilation 2. 1400 Clean source to BAL transla- tion 3. 1400 Clean source to PL/1 trans- lation Contact: W. Small, President  <b>CPU</b> CPU MANAGEMENT ADVISORY CORP. 853 Broadway, N.Y. 10003 (212) 777-7722
<b>NEW JERSEY</b>			<b>Paymaster Remedies X Payroll Problems</b> • a comprehensive payroll system • now serving over 1000 companies • license for as low as \$250 a month • up to 20 customized deductions and/or allowances ... all with Y-T-D totals • handles piecework, including cal- culations of make-up pay • accepts input from time cards • accepts input from terminals • integrated job costing • labor distribution • integrates personnel/payroll records • completely compatible with IBM 360/370 batch and RJE; Honeywell 200/2000; and Burroughs 1700-4700 • available to companies, institu- tions and service firms under licensing or purchase  <b>COMTECH</b> the computer package people P.O. Box 784 Reston, Va., 22070 Telephone (703) 471-7141
<b>POPULAR SERVICES, INC.</b> S/370 145-135-125 S/360 50- 40- 30  1287 OPTICAL SCANNER 2671 PAPER TAPE READER  <b>ALL SHIFTS</b> (201) 471-2577	<b>NEED TIME</b> 360/65 DOS 512 K with 7080 Emulator 12 Tape Drives 16 2314 Disk Drives On and Off Line Printers  Interested in Selling Block Time Five or Seven Days a Week Located in Chicago Central Business District Excellent Physical Facilities Will Provide Office & Storage Call (312) 225-6800, Mr. Zimmer	<b>Software for Sale</b>  <b>IBM 360/30</b> <b>Time for Sale</b> 64K; 4-2311 Disks; 2-2401 Tape Drives; 1100 Ipm Printer Reasonable Rates Nights & Weekends Available  Call George Walker at (312) 326-5151 or (312) 881-0392	<b>SYSX</b> <b>LOOKING FOR SOFTWARE?</b> Free Software Search and Package Appraisal Service  Our job is to help you locate the software packages which best meet your needs. There is no charge to you for this service. Write on your company letter- head or call:  <b>Systems Exchange Co.</b> 1034 Colorado Ave. Palo Alto, Calif. 94303 (415) 328-5490
<b>NEW YORK</b>  <b>I.B.M. - 360-30</b> All Shifts 65K, 4-2401 MOD-2, 3-2311, 1403-N1, 2540, 1401 Compatibility From \$35.00/Hour Restaurant Associates Ind. 1540 Broadway bet. 45 & 46th St. New York, New York 10036 Contact: Al Palmo at (212) 974-4966 Elliott Musikoff at (212) 974-4967  <b>ALL SHIFTS AVAILABLE</b> 360-40 with 2319 Disks And 3420 Tape Drives Also 1287 Optical Reader For excellent rates contact: Mel Lintz at DATAMOR CORP. (212) 564-3030	<b>370/155</b> 2 meg, 3330 (8m), 2314 (8m), 10 3420-5 tape, 2 1403, 3211. OS/VS2, RJE, IMS, TSO, DOS emul. 24 Hours - 7 Days CAN YOU BEAT 7.2 cent/sec for a 60K region?  <b>370/135</b> 2 meg, 3330 (8m), 2314 (8m), 10 3420-5 tape. Weekdays 8am-8pm 8pm-8am Not Avail \$135/hr. \$95/hr. \$85/hr. \$85/hr. \$75/hr.  <b>370/135</b> 144K, 1 2314, 4 2311, 6 3420-5 Tapes 8am-8pm 8pm-8am \$85/hr. \$55/hr. \$40/hr. \$35/hr. \$35/hr. \$30/hr.  <b>370/135</b> 240K, 4 3330's, 1 2314, 6 2401-6 Tapes - Rates same as 370/135 above  <b>360/30</b> 64K, 6 2401 Tapes, 5 2311's 8am-8pm 8pm-8am \$45/hr. \$35/hr. \$25/hr. \$25/hr.	<b>SAVE \$44,040 on PAYROLL/PERSONNEL SYSTEM</b> Typical costs of designing and imple- menting payroll in house approxi- mates \$45,000, you can spend only \$960 and install Super/Pay, as over 30 firms have already done. - All COBOL-48K or above - Variable of fixed input - Disk or tape-IBM or others - State and local taxes - DOS or OS - Unlimited deduction & earnings - Vacation and sick leave acctg. - Skill and education profile - Outstanding documentation - 30 day trial  Try the system as others have and we know you will like it. Ask about our General Ledger Accounts Payable & Receivable available at the same plan. Call or write Today Datafile Corporation 6430 Sunbelt Blvd. Los Angeles, Calif. 90028 (213) 461-4888	<b>SYNS</b> <b>COMPUTERIZED ACCOUNTS RECEIVABLE Features</b> 1. Automatic Cash 2. Multi-divisional 3. Cash forecasting 4. Deduction notices 5. Unearned discount 6. Dunning 7. Audit trails 8. Customized aging 9. Automatic charge-back 10. Cash tear-sheet 11. Suspense accounts 12. Expanded credit 13. General ledger totals 14. Marginal account reports 15. Credit interchange 16. On-line cash 17. Real-time credit inquiries <b>Benefits</b> Eliminate all these headaches: 1. Tub files 2. Late statements 3. One cash card per invoice 4. Extensive clerical effort 5. Unknown credit risks 6. Unclear detailed non-exception reports 7. Unaware credit managers  <b>COMPUTER SYSTEMS &amp; EDUCATION CORP.</b> David Shearin 111 Ash Street E. Hartford, Conn. 06108 (203) 528-9211  <b>CSEC</b> Certified Software Products, Inc. 3050 Metro Drive Minneapolis, Minn. 55420 (612) 854-3976  <b>AR/70</b> Thomas Welsh 840 Hinckley Road Burlingame, Calif. 94010 (415) 697-3317
<b>SCARE UP SOME BUSINESS ...</b> ... Advertise in Computerworld	<b>FOR FURTHER INFORMATION CALL PAUL SARRIS OR RON ELLIS (312) 346-1331</b>  <b>computer research company</b> 200 N. Michigan Av. Chicago, Ill. 60601 Largest Computer Time Sales Company	<b>Over 50,000 qualified paid subscribers read Computerworld every week.</b>	

# CHAMELEON

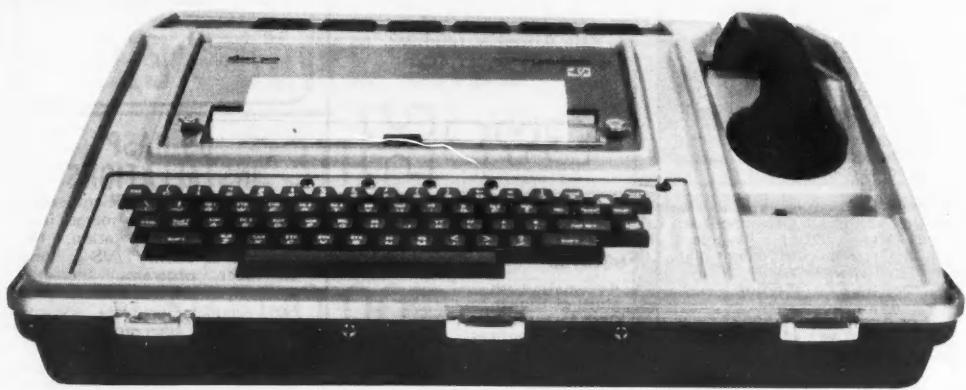
It's Decision Data's 9660 Sorting Data Recorder with OEM interface for use on-line. Off-line it can keypunch, verify, reproduce, interpret, gangpunch, interfile and sort 96 column cards. Now it's interfaced for on-line use too! Presto, it's a 300 cpm reader, a 60-120 cpm output printing punch, a keyboard for direct entry, control or inquiry. And its dual hoppers let you perform card reader and output punch operations while six output stackers let you separate the files of cards read in or punched out of the system. Then there's a toggle-switch that lets it change colors back to off-line where it's a keypunch, a verifier....



THE 9660: Another SuperMachine from Decision Data.

 **DECISION DATA®**  
COMPUTER CORPORATION  
100 WITMER ROAD, HORSHAM, PENNA. 19044  
(215) 674-3300 □ TELEX 83-1471

## 30 characters-per-second “Silent 700” portable data terminal.



### \$2780. Immediate delivery.



In the office or on the go, the *Silent 700* Model 725 portable data terminal puts your computer as close as the nearest telephone.

The Model 725 is equipped with a built-in acoustic coupler and is packaged in an attractive carrying case.

Features include high speed half- or full-duplex operation and quiet, non-impact printing.

Field proven reliability. Records show an average of only 1.2 service calls per year on the thousands of

terminals in use.

Field service is as near as the offices listed below.

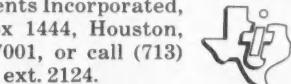
**Low cost.** Quantity one purchase price is only \$2780.00. Lease prices range from \$100.00 to \$145.00 per month, maintenance included.

For more information, contact your nearest TI sales office or Texas Instruments Incorporated, P. O. Box 1444, Houston, Texas 77001, or call (713) 494-5115, ext. 2124.

\*Trademark of Texas Instruments Incorporated

Arlington, Va. (703) 525-1444 · Atlanta, Georgia (404) 458-7791 · Chicago, Illinois (312) 671-0300 · Cleveland, Ohio (216) 464-1192 · Dallas, Texas (214) 238-5318 · Dayton, Ohio (513) 294-0774 · Denver, Colorado (303) 758-5536 · Detroit, Michigan (313) 553-0830 · Hamden, Conn. (203) 281-0074 · Houston, Texas (713) 777-1301 ext. 261 · Los Angeles, Calif. (213) 860-1379, (714) 547-9221 · Minneapolis, Minn. (612) 835-5711 · Newark, N.J. (201) 574-9800 · Orlando, Florida (305) 544-3535 · Philadelphia, Penn. (215) 643-6450 · San Francisco, Calif. (415) 732-1840 · Waltham, Mass. (617) 890-7400

**TEXAS INSTRUMENTS**  
INCORPORATED



TEXAS INSTRUMENTS INCORPORATED

DIGITAL SYSTEMS DIVISION  
P. O. BOX 1444 HOUSTON, TEXAS 77001



**The Computer Caravan welcomes:**

**TEXAS INSTRUMENTS INCORPORATED**

as an exhibitor in The Spring 1974 Caravan.

Texas Instruments' personnel will be demonstrating the latest in the TI line of high-performance, low-cost digital minicomputers and "Silent 700" Electronic Data Terminals including the ASR teletypewriters and portable terminals.

\* Trademark of Texas Instruments

**What may we say about your company?**

**The Computer Caravan/74**

sponsored by

**COMPUTERWORLD**

Washington • Cincinnati • Houston • Anaheim

San Francisco • St. Louis • Chicago • Boston

Charlotte • New York

797 Washington St., Newton, Mass. (617) 332-5606



## DPF Reports Earnings Up in 1st Quarter

WHITE PLAINS, N.Y. — DPF Inc. reported an improved financial picture to shareholders at the recent annual meeting here.

"The possibility of additional growth opportunities through acquisition seems promising," President Bertram J. Cohn observed.

In the first quarter ended Aug. 31, the firm reported earnings of \$155,000 or 4 cents a share, after a special credit of \$206,000 from repurchase of debentures.

In the year-ago period, DPF showed earnings of \$20,000, after a \$20,000 special credit.

In the same 1971 quarter, DPF lost \$34.3 million as a result of a change in depreciation policy and adopted a break-even accounting basis for revenues from the System 360 portfolio.

Revenues declined to \$7.7 million from \$8.9 million in the year-ago period ended Aug. 31.

First quarter revenues exceeded related costs by \$539,000 in 1973 and \$1 million in 1972. These amounts have been included in depreciation to offset projected future excess costs over revenues, the firm said.

All of the firm's CPUs are on rent, as they were at the end of

the fiscal year in May, Cohn noted.

### Reduced Off-Rent Position

During the year ended in May, the firm reduced the off-rent position of its total portfolio from 4.3% to 2.8%, and the average remarketed lease term has been increased to 24 months, according to Michael Creedon, executive vice-president, marketing.

DPF reduced the equipment coming off lease and remarketed 33.5% of its total portfolio compared with 36.6% in fiscal 1972, he said.

In addition, the firm reduced its cost of remarketing equipment from 6% of the original equipment cost to about 1.5%.

Creedon said lease terminations declined from \$78 million to about \$67 million.

Speaking of the firm's 370 leasing program, Creedon noted DPF has entered into a marketing agreement with Memorex, and is "presently negotiating to add high-speed tape drives, IBM 3330-compatible disk storage drives, and a new independent memory for this program."

Cohn observed that during the year ended May 31, the firm had reduced its overall bank and secured debt to \$12.5 million from \$32.4 million.

During the first quarter, the firm increased its investment in short-term commercial paper and marketable securities by \$4.2 million rather than continuing the prepayment of its IBM secured debt.

Interest earned on commercial paper exceeded the secured debt rate by about 1.5%, Cohn added.

## Calcomp Jumps Into Black for 1973

ANAHEIM, Calif. — With help from a healthy fourth quarter, California Computer Products, Inc. showed earnings of \$465,000 or 16 cents a share for the year, overcoming a first quarter deficit of \$2.3 million.

The year's earnings contrast with a loss of \$12.9 million or \$4.72 a share in 1972.

Revenues were up 49% to

\$80.3 million from \$53.9 million a year ago.

In the fourth quarter, earnings totaled \$1.1 million or 37 cents a share and revenues reached a record \$25.3 million.

President Lester L. Kilpatrick said he expects revenues for the current fiscal year to top \$100 million based on current operating levels and backlog.

## Toward the Bottom Line

Cordura's board of directors authorized the purchase of up to one million shares of its outstanding common stock, to be used for possible future acquisitions, employee benefit programs and stock option plans.

\$\$\$

Dearborn-Storm has declared a regular quarterly cash dividend of six cents a share to be paid Oct. 26 to shareholders of record Oct. 5.

\$\$\$

National Liberty Corp. plans to acquire the minority holdings of its 59% owned subsidiary, National Information Systems Corp. The NIS board endorsed

the proposed tender in principle. Price and terms have not been determined.

\$\$\$

Analytical Development Associates Corp., Cupertino, Calif., has received \$400,000 in equity financing from the private sale of preferred stock. Proceeds will be used to expand its Mednet medical communications system.

\$\$\$

The Palmer Organization of Boston has invested \$100,000 in American Systems, maker of voice response time-sharing systems for the handicapped and \$300,000 in Dynastor, developer of a flexible disk unit.

## The Computer Caravan welcomes:

**TEXAS INSTRUMENTS INCORPORATED**

DIGITAL SYSTEMS DIVISION  
P. O. BOX 1444 HOUSTON, TEXAS 77001

**What may we say about your company?**

**The Computer Caravan/74**

sponsored by

**COMPUTERWORLD**

Washington • Cincinnati • Houston • Anaheim

San Francisco • St. Louis • Chicago • Boston

Charlotte • New York

797 Washington St., Newton, Mass. (617) 332-5606

## Earnings Reports

**ANDERSON JACOBSON**  
Three Months Ended June 30

	1973	1972
Shr Ernd	\$0.04	\$0.03
Revenue	1,921,023	1,197,252
Spec Cred	... a36,694	...
Earnings	91,925	87,512

a-From sale of land.

**ANALYSTS INTERNATIONAL**  
Year Ended June 30

	1973	1972
Shr Ernd	\$21	\$12
Revenue	3,100,000	2,200,000
Earnings	179,000	98,000

**MATHEMATICAL APPLICATIONS GROUP**  
Three Months Ended June 30

	1973	1972
Shr Ernd	\$0.02	(\$0.08)
Revenue	885,795	414,208
Earnings	13,315	(66,719)

a-Adjusted for a three-for-two stock split in March 1973.

**ADDRESSOGRAPH-MULTIGRAPH**  
Year Ended July 31

	1973	1972
Shr Ernd	\$55	\$2,07
Revenue	489,849,000	441,555,000
Spec Chg	all,357,000	...

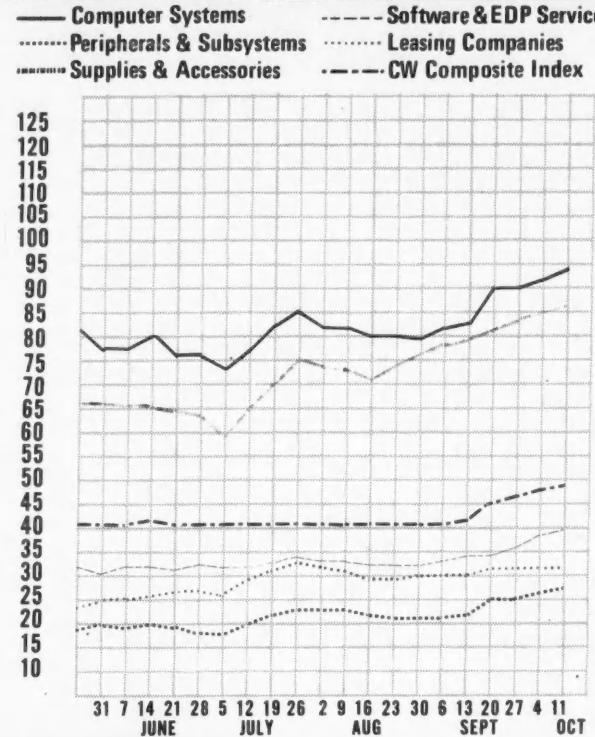
a-Consists of provisional charge of about \$12.6 million for domestic accounts receivable and inventory adjustments in the third and fourth quarters, less about a \$1.2 million credit from sale of plant and devaluation of the U.S. dollar.

**ON-LINE SYSTEMS**  
Three Months Ended July 31

	1973	1972
Shr Ernd	\$33	as.13
Revenue	1,897,031	1,262,940
Earnings	262,752	105,420

a-Adjusted for a three-for-two stock split in March 1973.

### COMPUTERWORLD Computer Stocks Trading Indexes



**IPS COMPUTER MARKETING**  
Nine Months Ended May 31

	1973	1972
Shr Ernd	\$35	\$43
Revenue	7,371,281	4,263,147
Earnings	169,710	117,565

### SDL

	1973	1972
Shr Ernd	\$75	...
Revenue	9,900,000	\$5,800,000
Earnings	1,500,000	(434,000)

**MOHAWK DATA SCIENCES**  
Three Months Ended July 31

	1973	1972
Shr Ernd	...	\$0.05
Revenue	\$40,970,000	33,466,000
Earnings	(1,311,000)	289,000

a-Includes results of Elastolabs Corp. and Computing Efficiency Inc. acquired January and March 1973, respectively.

**GENERAL INSTRUMENT**  
Three Months Ended Aug. 26

	1973	1972
Shr Ernd	\$49	bs.30
Revenue	105,005,002	76,827,177
Earnings	3,741,635	2,489,780

b-Mo Shr .85 b.50  
Revenue 201,376,755 148,099,659  
Earnings 6,577,969 4,272,522

a-Restated to reflect subsequent pooling-of-interests. b-Adjusted for a 2% stock dividend paid in May 1973.

**ANALOG DEVICES**  
Three Months Ended Aug. 4

	1973	1972
Shr Ernd	\$26	\$20
Revenue	5,747,787	4,088,314
Earnings	346,393	261,168

10 Mo Shr .72 .50  
Revenue 15,622,164 11,332,842  
Earnings 961,909 656,883

## \* WANTED \*

Firms to:

Buy

Sell

Lease

Sub-Lease

360 Systems

Write or Call Collect — Today

It's our only business



**COMPUTER SALES, INC.**

Suite 616, Benjamin Fox Pavilion  
Jenkintown, Pa. 19046 • (215)-887-5404

## COMPUTERS NEED

## U.C.P.\*

### \*UNINTERRUPTIBLE COMPUTER POWER

#### SYSTEM 700UCP PROVIDES

- VOLTAGE CONTROL
- FREQUENCY CONTROL
- TRANSIENT CONTROL
- LINE ISOLATION
- BRIDGES UTILITY POWER INTERRUPTIONS



700UCP

VOLTAGE

FREQUENCY

COMPUTER

Get the facts on

### UNINTERRUPTIBLE COMPUTER POWER

Call Frank Wood (804) 355-2803

OR WRITE

POWER SYSTEMS & CONTROLS, INC.

P.O. BOX 27306 • RICHMOND, VIRGINIA 23261

PSC

All statistics compiled,  
computed and formatted by  
**TRADE★QUOTES, INC.**  
Cambridge, Mass. 02139



## Computerworld Stock Trading Summary

TRADE QUOTES

	1973	CLOSE	WEEK	WEEK	1973	CLOSE	WEEK	WEEK	1973	CLOSE	WEEK	WEEK	
	RANGE	OCT 10	NET	PCT	(1)	1973	CHNGE	CHNGE	H	(1)	1973	CHNGE	CHNGE
<b>COMPUTER SYSTEMS</b>													
N BURROUGHS CORP 211-245 227 3/4 +5/8 +0.2													
N COLLINS RADIO 16-26 24 5/8 +1/8 +0.5													
O COMPUTER AUTOMATION 5-19 19 1/8 +1/8 +6.2													
N CONTROL DATA CORP 31-62 45 3/8 -5/8 -1.3													
O DATA GENERAL CORP 28-46 43 3/4 -1 1/2 -3.3													
O DATAPoint CORP 10-21 17 1/2 -1 1/8 -0.7													
O DIGITAL COMP CONTROL 2-6 3 1/8 0 0.0													
N DIGITAL EQUIPMENT 73-105 99 7/8 +1 3/8 +1.3													
N ELECTRONIC ASSOC. 4-9 6 1/8 +1/8 +2.1</													

# Some people get the picture quicker than others.

## Thanks to graphics.

How? Take a look at our 4010 family of low-cost graphic terminals. We'll show you how they cut endless hours of plotting . . . how fast they convert mounds of data into understandable charts, maps and drawings.

Applications? By the hundreds! Today, our graphics terminals are giving new, quick insights to leaders in research, education, business, math and science.

And getting the picture doesn't have to be costly. You can move up to graphics for as little as \$3,950.

There's more. Thanks to our CRT direct view storage screen, you can see clear graphics and alphanumerics in standard ASCII and APL on either 11" or high resolution 19" screens.

In minutes they plug into most computers and minis. And our broad-ranging software

support turns them on. Copy your result on our dry process, grey scale hard copy unit. Add to that displays, monitors, and paper tape units that enhance your graphics power.

Business forms are programmed and ruled fast with our 4023, the first alphanumeric terminal with upper and lower case and optional forms ruling.

No matter who you are or where you are, our worldwide Tektronix service backs you up. Which is another reason you should get our picture . . . and we should get acquainted.

Tektronix, Inc.  
Information Display Division  
P.O. Box 500  
Beaverton, Oregon 97005



**Graphics. The mind's eye,  
for those who think  
tomorrow.**

